THE ARCHITECTURAL RECORD

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THE ARCHITECTURAL RECORD

VOL. 70 NO. 6 DECEMBER, 1931

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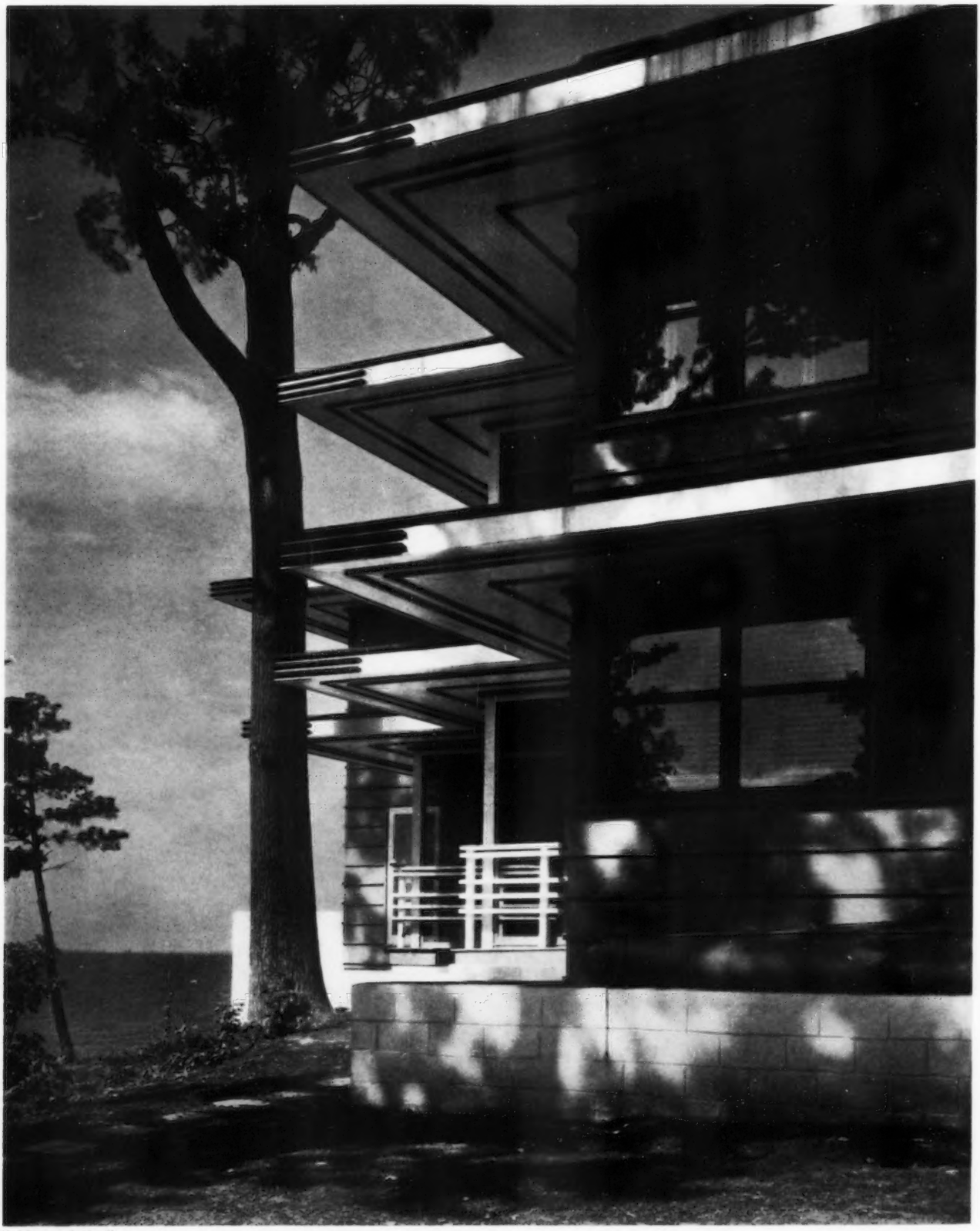


Tebbs and Knell

SUMMER COTTAGE OF L. CORRIN STRONG
GIBSON ISLAND, MARYLAND
ALEXANDER B. TROWBRIDGE, ARCHITECT

THE ARCHITECTURAL RECORD DECEMBER, 1931
VOL. 70—No. 6

There are factors which tend to make the demand for buildings greater than that arising solely from growth of population and from normal replacements. Among such factors are:

1. Improvement in the standard of living.
2. Shifts in population caused by migrations between districts within a city, between cities, and between rural and urban sections.
3. Relative increase in the number of "families." During the last census decade the growth in total population was 16 per cent, whereas the number of families increased 23 per cent.
4. A declining proportion of children has as its corollary an increasing proportion of adults. It is for the employed adult population that factories, shops and offices are constructed.

The decline in the rate of population growth and the factors which are causing it may retard certain kinds of construction and stimulate other types. Maintenance of the recent high normal volume of building will be conditioned primarily by a continued upward trend in the standard of living and by continued large-scale shifts of population between areas.

By SEYMOUR L. ANDREW, Chief Statistician
American Telephone and Telegraph Company

SOME POPULATION TRENDS AND THEIR RELATION TO THE CONSTRUCTION INDUSTRY

The famous population "clock" in the United States Bureau of the Census is now reported to be ticking at a slower tempo than it was a few years ago. This clock registers the gains in population of continental United States from births and immigration, the losses through deaths and emigration, and the estimated total population. During the last decade, it was so adjusted that it recorded a net gain of one person every 23 seconds; but on the basis of more recent information such a gain now occurs only every 36 seconds. This represents a slowing down in the annual increase in population from 1.2% to 0.7%.

The evidence supporting this estimate of the retardation of population growth seems to be very strong. Throughout most of the United States standardized records of vital statistics are now available; and these records indicate that the number of births is smaller than it was a few years ago, the number of deaths is larger, and the natural increase in population is smaller both numerically and relatively. Moreover, since immigration laws have become more and more restrictive, the increase in population through arrivals from foreign shores has of necessity declined.

Many students of the subject believe that the declining rate of population growth will continue into the future—apparently with good reason at least as far as the years immediately ahead are concerned. In view of the reduction in employment incident to the present economic depression, Congress is unlikely to liberalize the immigration laws for some time to come. Birth rates might conceivably be increased by changes in economic and social conditions, but it is improbable that such changes will take place with the rapidity necessary to counteract the effects of the decline in the proportion of the prolific immigrant races or the relatively rapid growth of urban centers which are less favorable to large families than are the rural areas. Also, medical and sanitary science will have difficulty in lowering death rates for individual ages in sufficient degree to offset the effects upon overall death rates of the relatively greater percentage of the population who are in the upper age groups.

Such a prediction does not mean that the construction industry or any other industry will fail to find opportunities for expansion in the future. Even if the population of the country should cease to grow, the need for construction would still continue to demand the services of the building industry on a large scale. Eventually all the present thirty million family quarters would have to be

replaced. If these should escape the hazards of fire, demolition, and conversion to business uses for an average of fifty years, building activity almost comparable with that of the year 1929 would sooner or later be necessary. (Of course, with the relative newness of present dwellings, it might be some time before replacements alone would provide this activity.)

But, fortunately, there are factors which tend to make the demand for houses and many other kinds of goods greater than that arising solely from growth of population and normal replacements. Not the least of these is the rapid improvement in the standard of living which has characterized recent years and which can be expected to continue in the future, subject perhaps to temporary interruptions. Increased insistence upon convenience and comfort on the one hand, and the latest "style" in design and decoration on the other, is already making obsolete many a residential and business building which reflects the standards of a passing generation.

An equally important phase of the rising standard of living, and one which is more closely related to the subject of population trends, is the tendency for people to move from the crowded districts in the central portions of cities to the periphery. As a result of this tendency, it becomes necessary to provide housing for a much larger number of people than the number constituting the mere growth in population. Thus, in the New York metropolitan area during the past decade the gain in population was about 2,400,000, but the component districts which grew increased by over 3,200,000. Houses for 825,000 people had to be built in the area, merely because the old houses were in the wrong locations. That this same factor is operating in many other cities may be seen from the following:

	Growth in Population 1920-1930	
	Entire Community	*Growing Wards*
Baltimore	71,048	127,146
Buffalo	66,301	126,962
Cincinnati	49,913	69,466
Omaha	22,405	35,982
Philadelphia	127,182	246,393
Rochester	32,382	49,226
St. Louis	49,063	90,529
Syracuse	37,609	51,255

Shifts in population which create a demand for new buildings are not confined within city limits. Of perhaps even greater importance are the migrations between rural and urban sections or even between state and state. The magnitude of these movements may be judged by a study of population changes in almost any state. In South Carolina, for example, while the growth in the last decade was only 55,000 for the state as a whole, the minor civil divisions which grew had an increase of 195,000, the remainder of the state showing a loss of 140,000. In this case, the new construction made necessary by intrastate population shifts was two and one-half times as great as that arising from growth alone. Other representative states show similar conditions:

	Growth in Population 1920-1930	
	Entire State	*Minor Civil Divisions Which Grew*
Arkansas	102,278	256,905
Delaware	15,377	27,116
Georgia	12,674	327,264
Indiana	308,113	453,691
Missouri	225,312	465,646
New Mexico	62,967	108,404
Virginia	112,664	227,372
Wyoming	31,163	46,804

Needless to say, such population movements appear to be on the increase. The prevalence of automobiles and good roads is a powerful factor in promoting mobility, since it is making wide areas around the larger cities available for residential purposes and at the same time is reducing the importance of many of the small trading centers which grew up in the days of horse-drawn vehicles and mud roads. The mechanization of farming and other rural industries is reducing the labor requirements in areas where these occupations are carried on, thereby making it imperative that many rural families seek their means of livelihood elsewhere. The growing tendency for older workers to retire and move to areas with attractive living conditions, and the increase in touring and vacationing, likewise add to the nation's mobility.

As already mentioned, one of the chief causes for the anticipated decline in population growth is the falling off in birth rates. The United States is rapidly becoming urbanized (56.2% of the population lived in cities in 1930 as against 51.4% in 1920) and the number of births per thousand of married women at each age is about a third less in urban territory than it is in the rural districts. The decrease in the proportion of immigrants in the female population between the ages of 15 and 44 (from 14% in 1920 to 10.5% in 1930) is also significant, since the fecundity rate is at least a quarter greater in foreign than in native stock. In all classes, too, there has apparently been a marked increase in birth control. In consequence of these factors, during the last decade the proportion of children under 14 years of age declined from 31.8% of the total population to 29.4%, while those under 5 years decreased in actual numbers.

It is entirely possible that this situation will shortly have a bearing upon the overall volume of projected school construction. At the time of the 1930 census, there were approximately 29 million children between the ages of 6 and 17, about 10 million of them being between 6 and 9 years old. By 1935, of course, those who were between 13 and 17 in 1930 will have generally completed their schooling, while those between 1 and 4 years will have embarked upon their formal educational careers. Making the necessary allowance for deaths, the total school population in 1935 can be readily calculated—with the conclusion that it will be between 300,000 and 400,000 less than it was

five years earlier, and will be approximately a million less in the lower grades. The need for school construction then will have to depend almost entirely upon shifts in population between areas, replacements, whatever demand for better school facilities may be fostered by advancing standards of living, and any increased tendency by the coming generation to remain in school beyond the minimum term fixed by legal requirements.

On this last point, it may be of interest to note the changes in the percentage of children attending school which took place in the decade ending with the recent population census. The percentage rose sharply in every age group, the increase being particularly marked in the high school and junior college years (ages 14 and 15 from 79.9% to 88.8%; ages 16 and 17 from 42.9% to 57.3%; and ages 18 to 20 from 14.8% to 21.4%). Persons 21 years of age and over attending educational institutions were three and one-half times as numerous in 1930 as they were in 1920.

The decline which is taking place in the number of children will of necessity be reflected in a continued downward trend in the average size of families. There is in addition another factor which during the last decade has decreased the number of persons per family (if family be defined as "persons living under the same roof"). This factor is the "spreading out" process whereby older people are moving out of the homes of their children to maintain their own establishments, and unattached persons are renting private apartments. (Such "spreading out" is characteristic of periods of prosperity and increasing standards of living; at present there may be a temporary reverse movement.) From 1920 to 1930 there was a decline of about a quarter of a person in the average size of families (based on returns from 44 states now available), a somewhat greater drop than had occurred previously during this century.

Further decline in the average size of families will accentuate any existing tendency toward the construction of smaller family quarters, and also will contribute to the demand for housing because of the fact that the number of families will increase relatively faster than the total population. This latter phenomenon was apparent in the last decade, during which the population of the United States grew at the rate of 16% whereas the number of families increased by about 23%. A striking illustration of this situation may be found in the case of certain cities which actually gained families although they lost population.

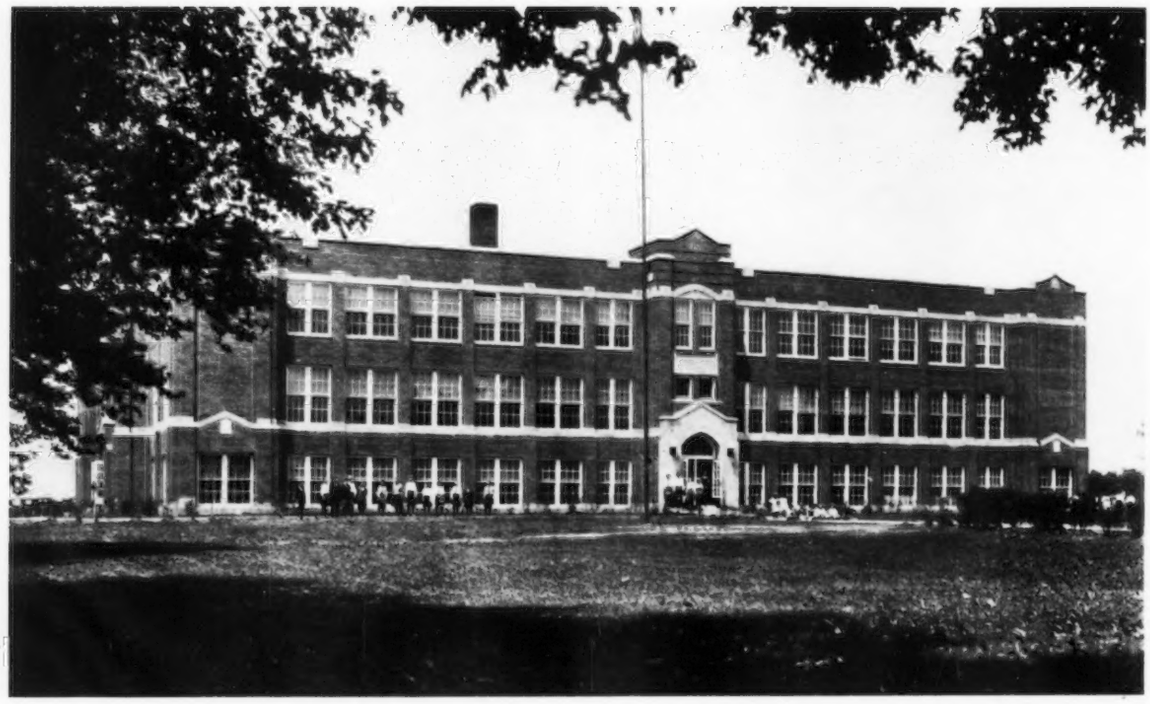
	Change in Population	*Number Families*	*Percentage Population*	*Change Families*
Wilmington ..	-3,571	1,206	-3.2	4.9
Manchester ..	-1,550	1,417	-2.0	8.1
Terra Haute ..	-3,273	867	-5.0	5.0
Brockton	-2,457	640	-3.7	4.0
Fall River ...	-5,211	678	-4.3	2.6
Holyoke	-3,666	1,062	-6.1	8.2
Lawrence	-9,202	382	-9.8	1.9
New Bedford .	-8,620	1,124	-7.1	4.2

A declining proportion of children has as its corollary an increasing proportion of adults, and a more rapid rate of growth in adult than in total population. These trends have been in evidence in the past, and seemingly will continue in the future. Thus, the estimate of one population authority that the United States will have 185,000,000 people in 1975, of whom 69% will be adults, involves a prospective growth of approximately 50% for the total population and 70% for the adult population. The significance of this for the building industries lies in the fact that it is the adult population which supplies the workers in factories, shops, and offices, and therefore is a determining factor in the amount of such construction as is necessary.

Other features of the changing age composition of the population may also be of interest. According to the calculations of the above-mentioned authority, the population above the age of 50 will more than double between 1930 and 1975, and a great part of the increase will be among those of 65 years and over. That this forecast may be conservative is indicated by the fact that a mere continuation of present mortality rates, with no allowance for improvement, would just about double the number in the 65 and over group in 20 years—a growth which might have an important influence on the amount of building which will take place in areas where "retired" population is likely to go and on the construction in all sections of the country of hospitals, sanitariums, and perhaps apartments.

The effect upon building activities of the increasing proportion of the population which is native born is uncertain. It seems to be true that even after immigrants have become well-to-do, they often continue to be content with relatively poor quarters in order to be near their old acquaintances and friends. But their children are much more likely to desire better housing and pleasanter environment. Between 1920 and 1930, foreign-born whites declined from 13% to 10.9% of the total population; and if the present immigration quotas are continued, the percentage in 1940 is likely to be as low as 9% and might fall below 8.5%. Numerically this would represent an actual loss of between one and two million, as against a loss of 350,000 during the last decade.

The relationship between building activity and population trends is a complex one. The influences which are causing the present decline in the overall rate of population growth, for example, may tend to retard certain kinds of construction and at the same time may stimulate other types. Improvements in the standards of living and shifts in population between areas may have a more pronounced and far-reaching effect than changes in the rate of growth. All things considered, there seems no warrant for any conclusion that the *normal* level of construction activity has yet been lowered or that a permanent reduction in this level is in prospect during the next decade at least.



LINCOLN CONSOLIDATED SCHOOL, YPSILANTI, MICHIGAN

UNIT CONSTRUCTION IN SCHOOL PLANNING

WARREN S. HOLMES COMPANY, ARCHITECTS

The Lincoln Consolidated School at Ypsilanti, Michigan, is on a 20-acre site in the rapidly growing fringe of the industrial district surrounding Detroit. It was planned to be practical and economical, and to provide for a rapid increase in enrollment and a probable revamping of its interior arrangement as well as additional space. Flexibility, or the adaptability of a building to changing educational practice and to larger or smaller class sizes, was secured by developing a building unit.

The most advantageous unit has been found to be a rectangular space 10 by 22 by 12 feet. The two latter dimensions represent the width of the usual classroom and its height. The first represents an arbitrary dimension selected for its adaptability.

A building is made up of a number of these units just as a bookcase is made up of sections, each unit complete and exactly like the others. A pair of units forms a small classroom; taken three at a time, a standard classroom 22 by 30 feet. Four units give the most efficient size for science and home economics rooms. When partitioned off singly, the units form offices, toilets, space for stairways, and the like. Since partitions are not load-bearing, a re-grouping of the units may be easily accomplished as the community changes or as educational practice takes on new forms.

Each unit is constructed complete in all its necessary physical requirements. It is provided with fresh air inlet, vent flue, heating element, window area and artificial lighting so placed that as rooms are decreased or increased in size by relocating partitions, heat, light and ventilation remain unchanged in proportion. Ducts, pipes and all structural parts are placed where such alterations will in no way interfere.

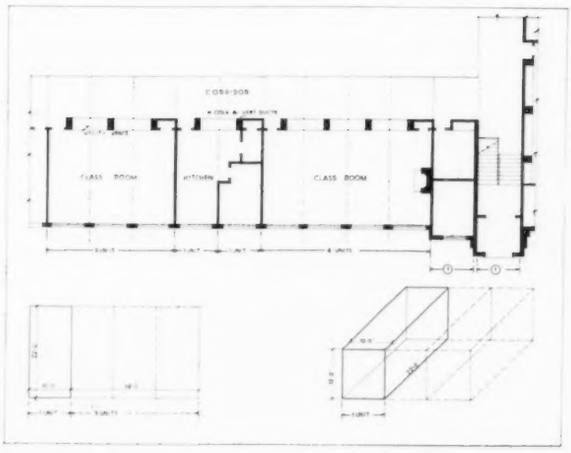
The completion of the Lincoln School demonstrated the economical advantages of the building unit. As the cost of automobiles has been decreased by quantity production, so has the same principle affected building practice. A $300,000 school building contains ordinarily about 125 building units, each built substantially like the others. Formwork, regularity of structural processes, insertion of pipes, conduits, grounds, etc., are methodical and organized. The contractor learns what to do, through repetition, with accuracy and dispatch. More work can be done in the shops by machine methods and shipped to the job ready for installation.

Another element contributing to economy is the fact that the adoption of a building unit focuses

the attention of engineers and draftsmen to a more careful study of a specific problem. Every item of the building unit becomes a research problem. It is obvious that improvements will be more readily encouraged and faults more easily located if attention is narrowed to a small unit rather than if spread over an entire building. The building unit in lending itself to these studies has contributed to the conservation of space, the utilization of economical building materials and a more efficient adaptation to classroom needs.

As a specific example, the steam radiator ordinarily parked beneath the outside window was moved to a recessed location in the corridor wall 7 feet above the floor level, thus increasing the effective width of the classroom from 6 to 10 inches. By putting the radiator in the fresh air duct and passing air about its heated surface, its efficiency was increased by 50% and its size reduced correspondingly. It was found, moreover, that the new location tended to a more uniform room temperature and that with fires banked at night the radiators, protected as they are from cold outside walls, hold their heat for long periods, maintaining rooms from freezing even under the most adverse conditions. Plants and flowers can be kept without injury on the window sills throughout cold nights in severe weather.

The building was planned for and adapted to a practical course of study. Instead of being little more than a mere box closed on three sides with blackboard or poorly ventilated coat rooms, each



The school building is made up of a number of units, each 10 by 22 by 12 feet. Standard classrooms consist of three units, larger rooms of four or more units. Single units, partitioned off, serve as space for offices, toilets, stairs and the like.

room was developed as a workshop. Laboratories for English, history and mathematics as well as for agriculture, chemistry and manual arts exemplify the fundamental principle that "one learns by doing."

Substituted for the ordinary corridor wall, H-shaped piers placed at regular intervals of 10 feet carry the interior loads. They are shaped so as to

R. C. Leavenworth

LIBRARY STUDY, LINCOLN CONSOLIDATED SCHOOL — WARREN S. HOLMES COMPANY, ARCHITECTS

Each unit in the room is provided with fresh air intake, vent flue, heating element, window area and artificial lighting so arranged that partitions may be easily relocated to meet changing educational needs.

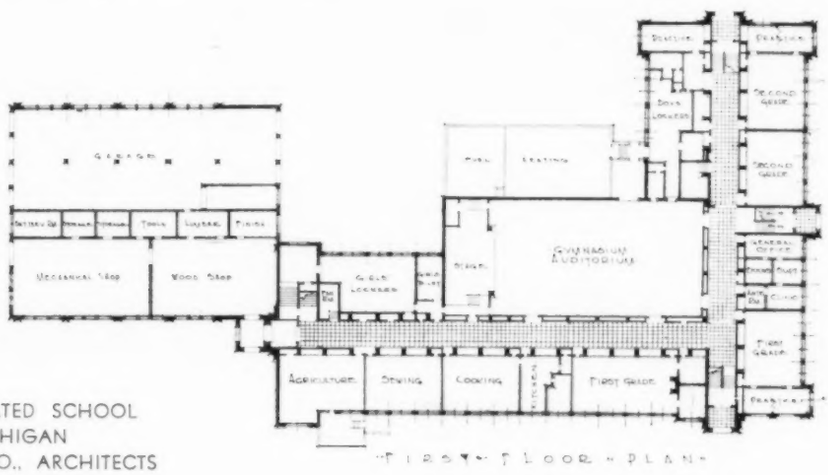
SOCIAL SCIENCE LABORATORY, LINCOLN CONSOLIDATED SCHOOL—WARREN S. HOLMES COMPANY, ARCHITECTS

H-shaped piers, placed at 10-foot intervals to carry interior loads, accommodate ventilating ducts. Space between piers is utilized for shelves, drawers, blackboards and other conveniences.

form the ventilating ducts. Between these piers enough space was saved to accommodate the necessary working conveniences of teachers and pupils. The classroom for social science, for instance, contains a reading case for periodicals and books within easy reach of pupils, thus encouraging their most effectual use. Likewise, the exhibit case, filing case, abundant bulletin board space, a reduced but well-balanced amount of blackboard, and a map rail stimulate teachers and pupils to a more effective plane of teaching and learning.

Under the guidance of Dr. M. S. Pittman and Principal H. A. Tape, leaders in rural education, the building stands not only as an interesting development in community requirements, but also as a practical center of modern educational philosophy.

A $300,000 school building contains ordinarily about 125 units, each constructed substantially like the others. Much of the work can be done in shops by machine methods and shipped to the job ready for installation.



LINCOLN CONSOLIDATED SCHOOL
YPSILANTI, MICHIGAN
WARREN S. HOLMES CO., ARCHITECTS

SCHOOLS

AVERY COONLEY SCHOOL, DOWNERS GROVE, ILLINOIS
WALDRON FAULKNER, ARCHITECT — HAMILTON, FELLOWS AND NEDVED, ASSOCIATED

OTHER BUILDINGS ILLUSTRATED IN THIS PORTFOLIO:

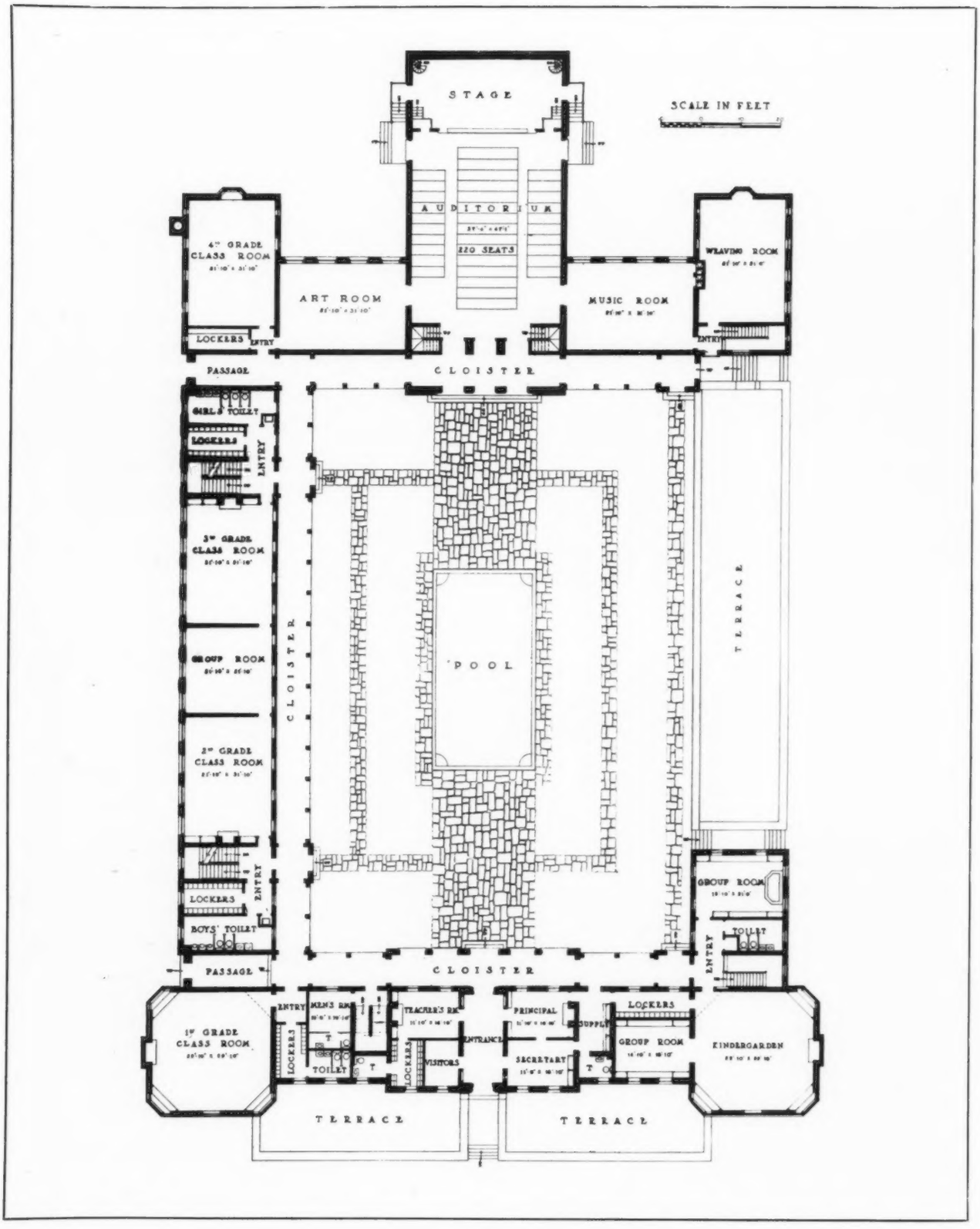
SCHOOL OF EDUCATIONAL RESEARCH, NEW YORK CITY—Page and Vogelgesang, Interior Architects.

GRADE SCHOOL IN HUSUM, COPENHAGEN—Edvard Thomsen and Fritz Schlegel, Architects.

MEN'S DORMITORY GROUP, MAIN HALL, AND MINERAL INDUSTRIES BUILDING, PENNSYLVANIA STATE COLLEGE—Charles Z. Klauder, Architect.

PORTFOLIO OF CURRENT ARCHITECTURE

DECEMBER 1931



AVERY COONLEY SCHOOL, DOWNERS GROVE, ILLINOIS
WALDRON FAULKNER, ARCHITECT
HAMILTON, FELLOWS AND NEDVED, ASSOCIATED

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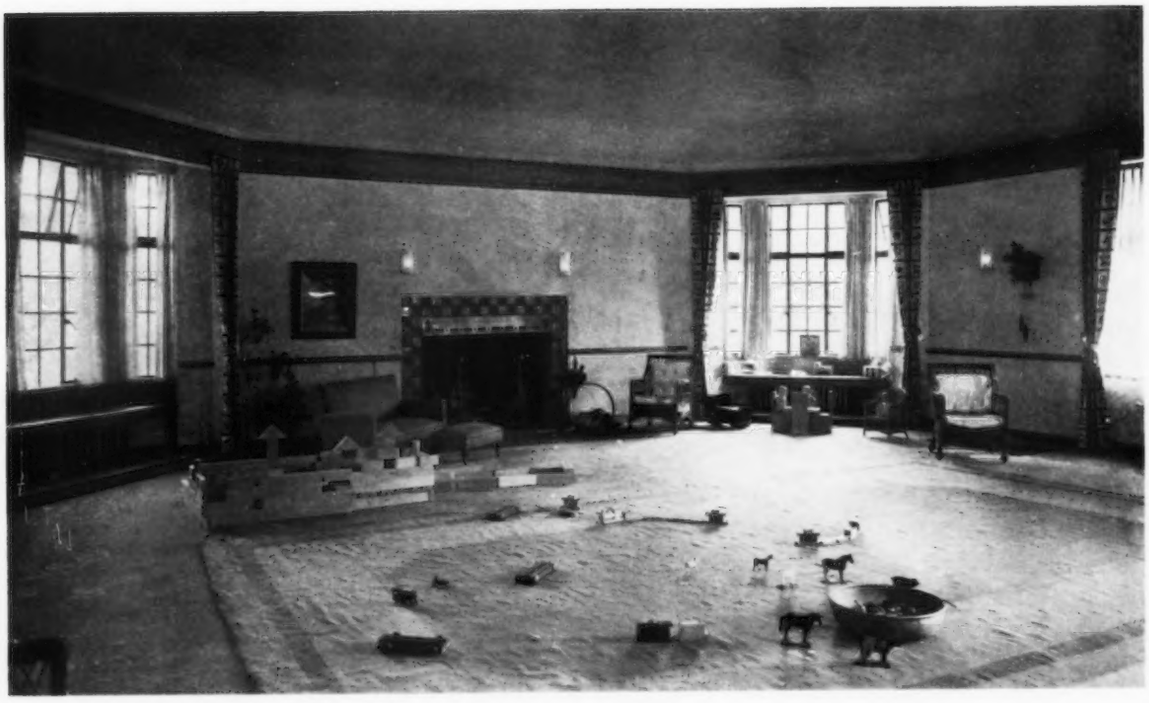

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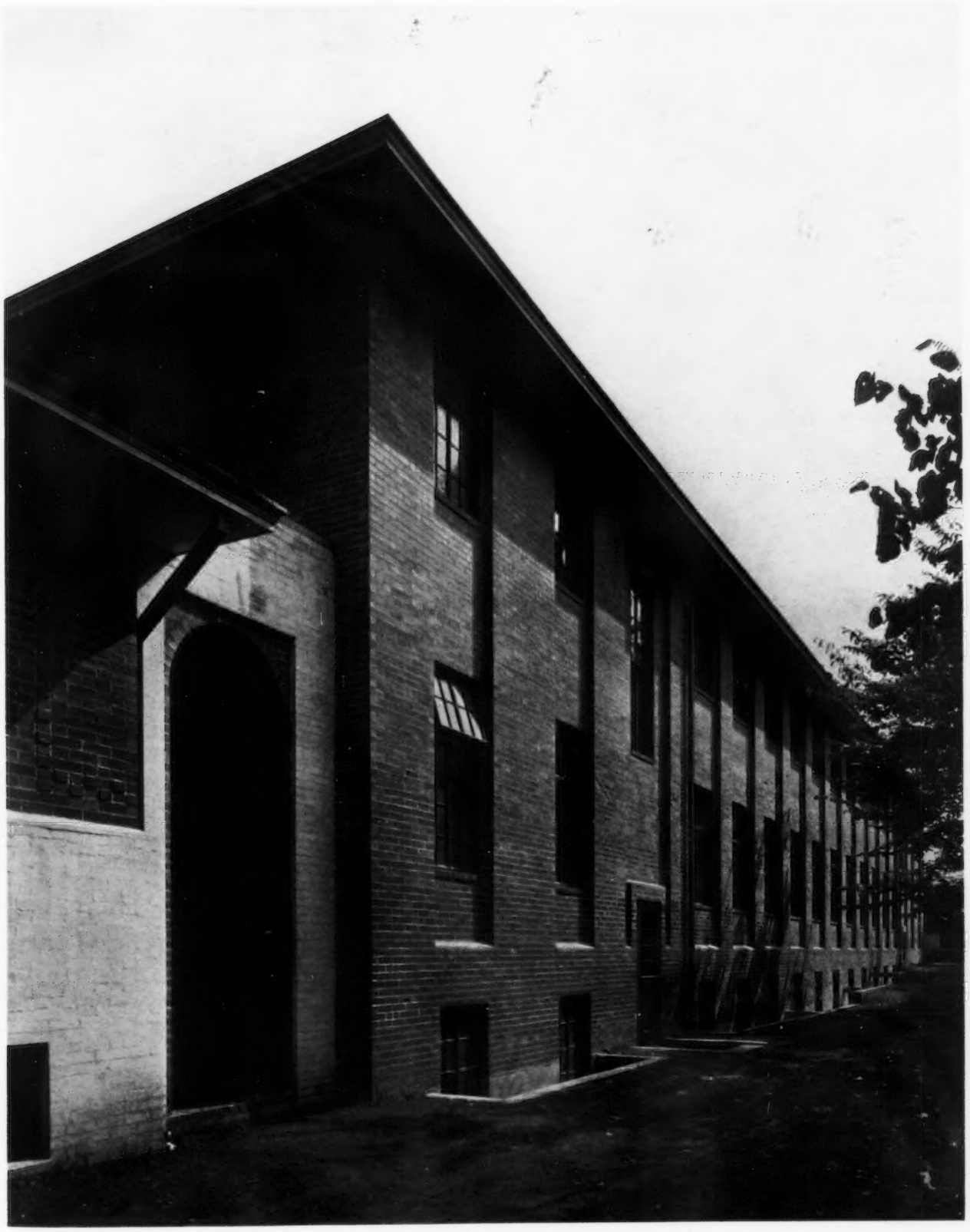

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HAMILTON, FELLOWS AND NEDVED, ASSOCIATED

MacMee Photos

SCHOOL OF EDUCATIONAL RESEARCH
NEW YORK CITY
PAGE AND VOGELGESANG, INTERIOR ARCHITECTS

Above: Lecture hall. Walls of natural sand finish plaster; floor of Indian red linoleum.

Below: Library.

MacMee Photos

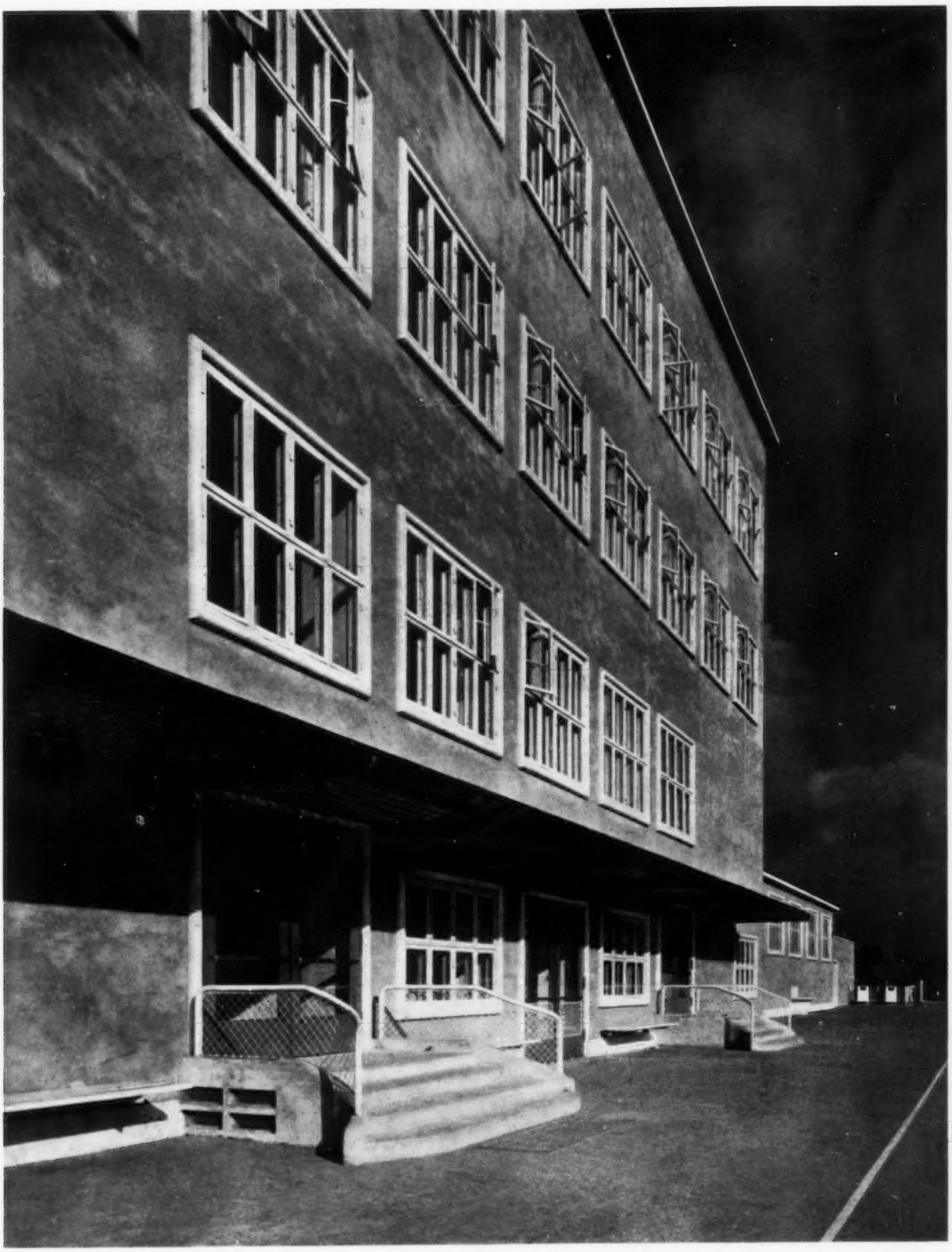
Sitting room at end of library. Walls of rust color; fireplace midnight blue. Waxed oak floor and deep emerald green carpets.

SCHOOL OF EDUCATIONAL RESEARCH
NEW YORK CITY
PAGE AND VOGELGESANG, INTERIOR ARCHITECTS

Jonals

GRADE SCHOOL IN HUSUM, COPENHAGEN
EDVARD THOMSEN AND FRITZ SCHLEGEL, ARCHITECTS

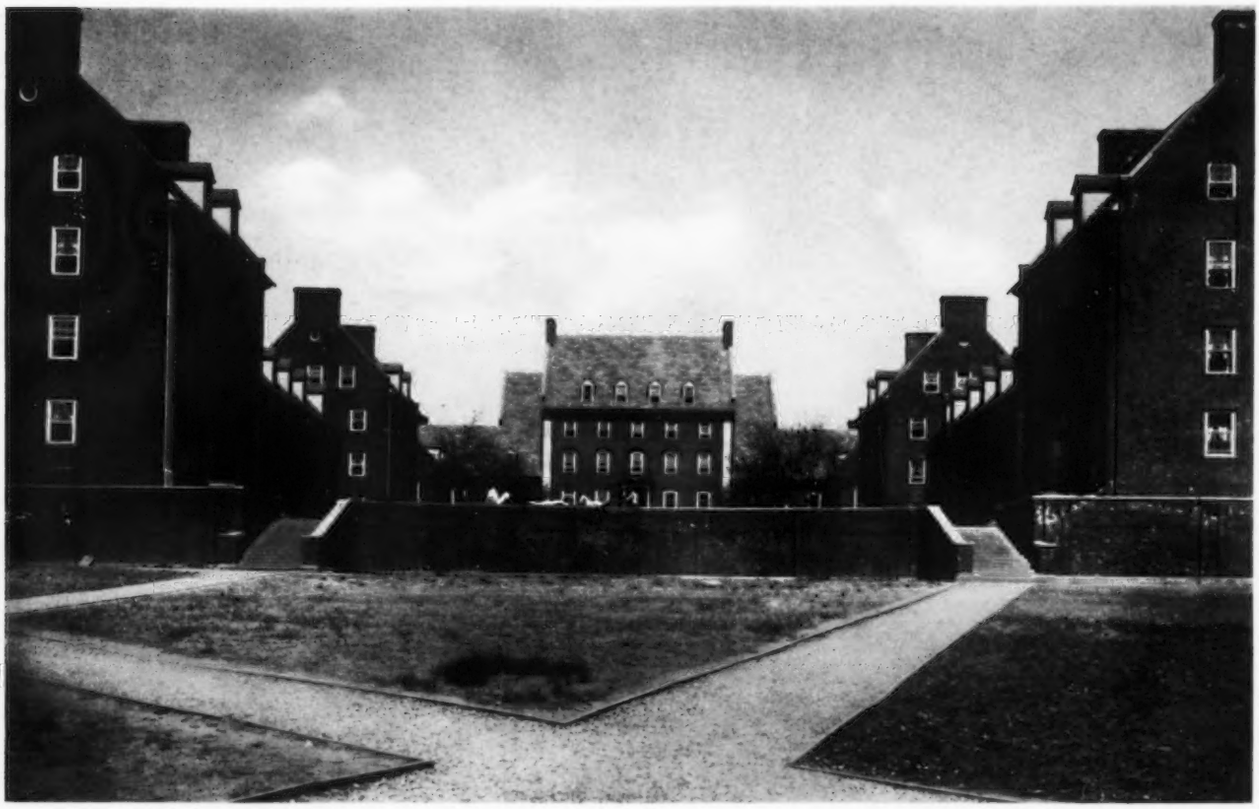
Interior court used as play space in bad weather. Balcony corridors give access to classrooms.

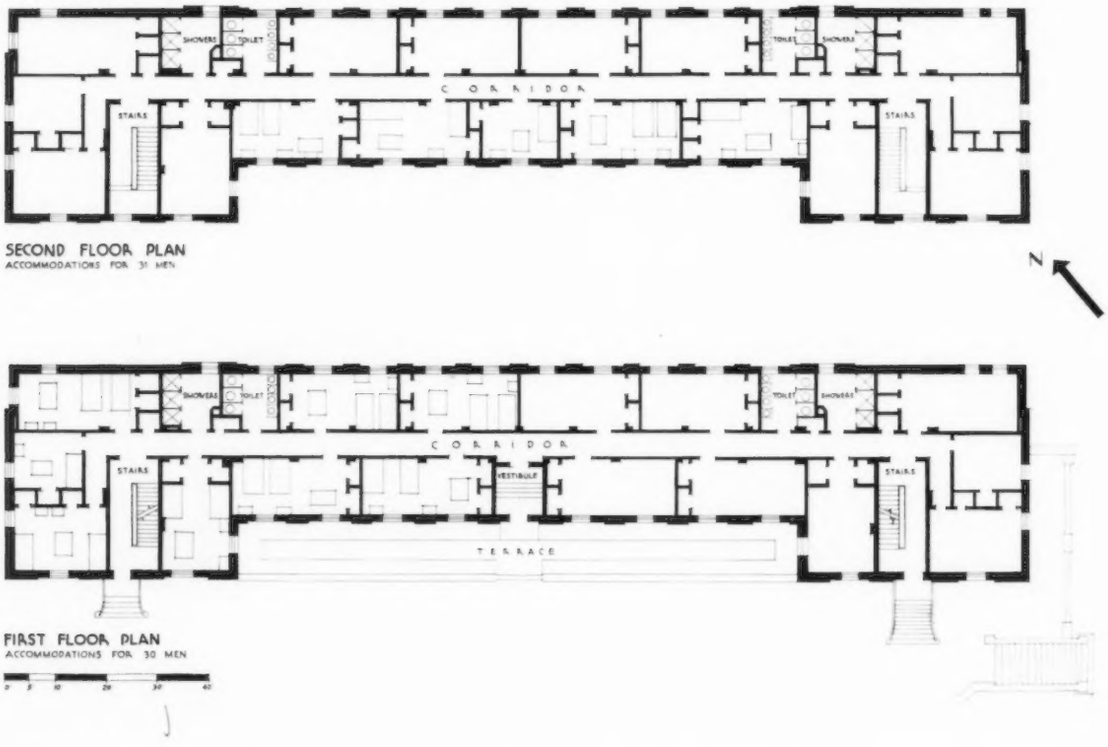


Jonals

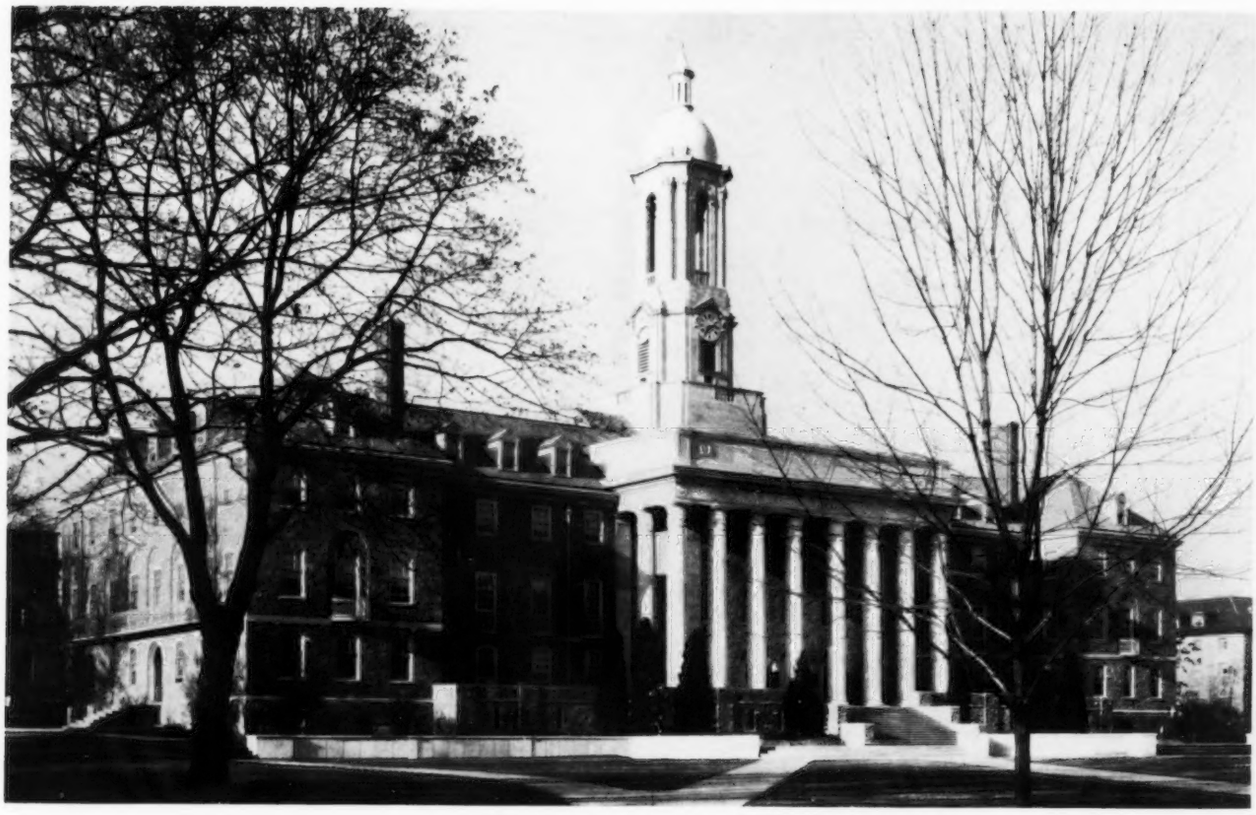
The roof of this grade school is utilized for calisthenics and sun bathing.

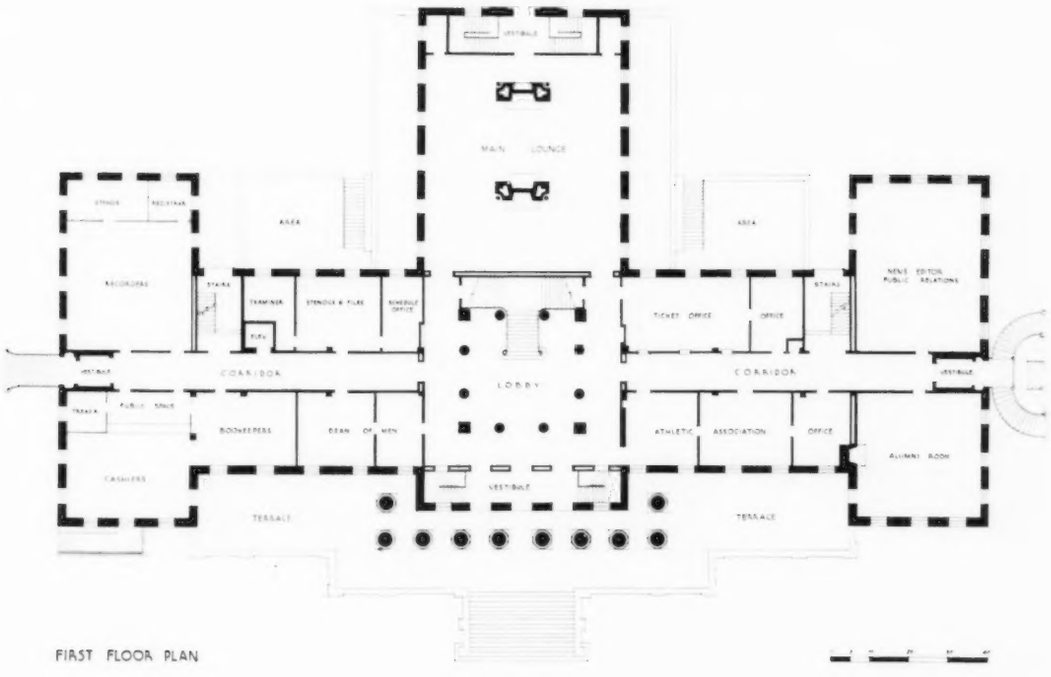
GRADE SCHOOL IN HUSUM, COPENHAGEN
EDVARD THOMSEN AND FRITZ SCHLEGEL, ARCHITECTS





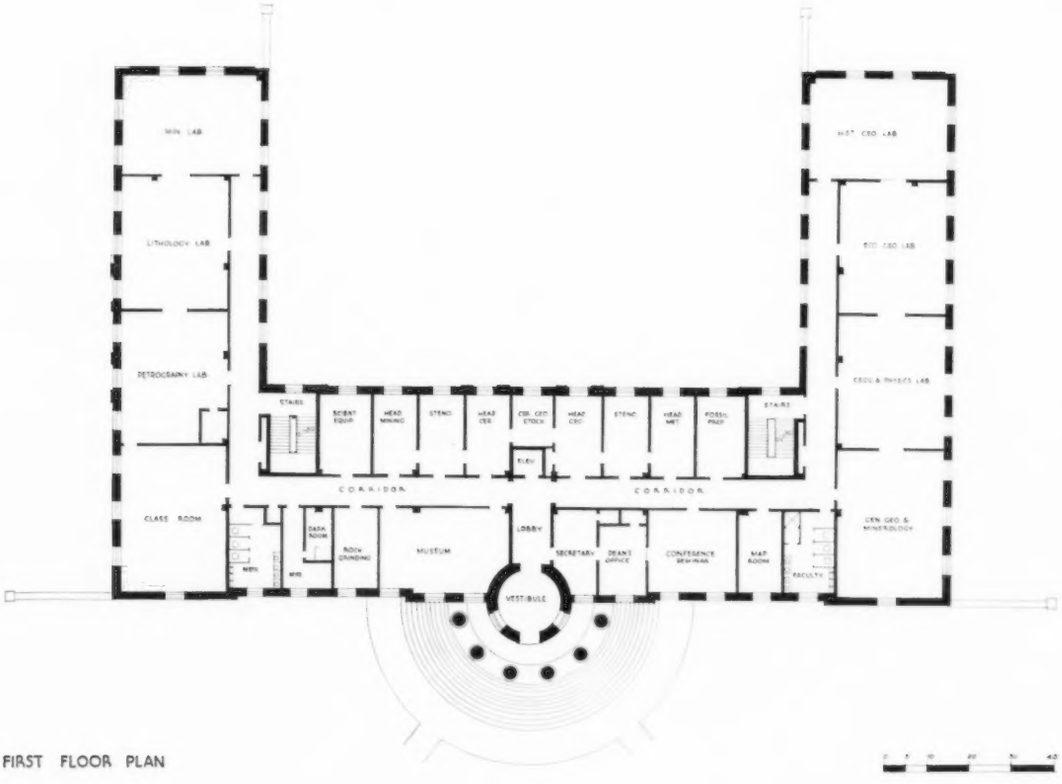
MEN'S DORMITORY GROUP
PENNSYLVANIA STATE COLLEGE
CHARLES Z. KLAUDER, ARCHITECT





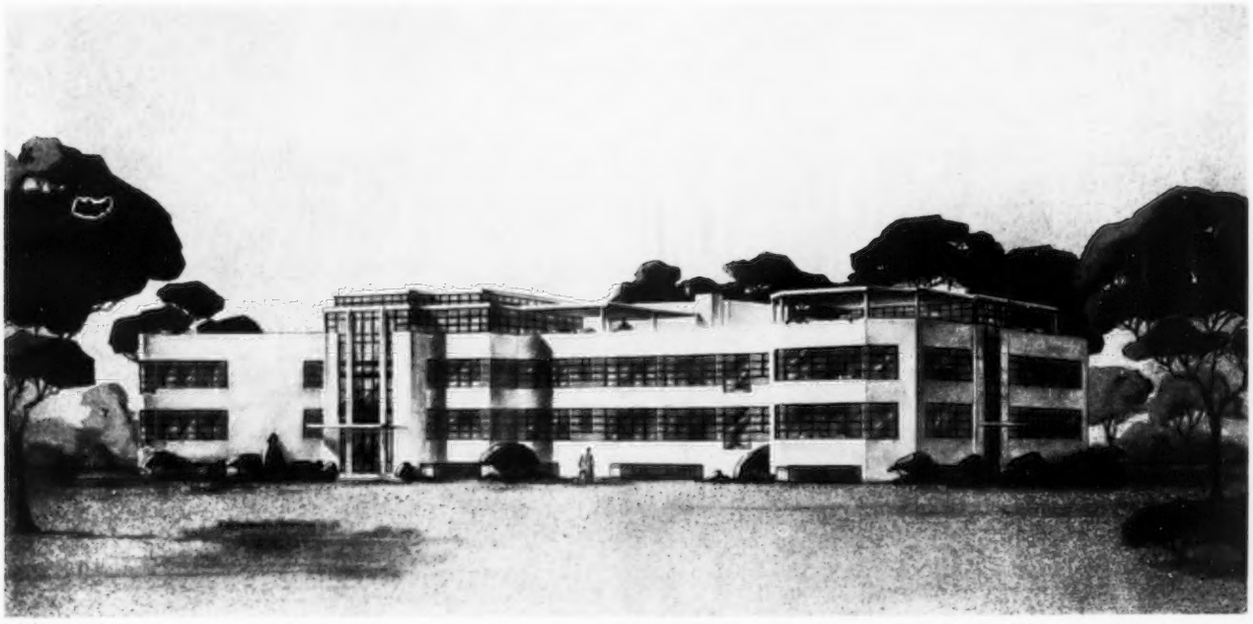
FIRST FLOOR PLAN

MAIN HALL
PENNSYLVANIA STATE COLLEGE
CHARLES Z. KLAUDER, ARCHITECT



FIRST FLOOR PLAN

MINERAL INDUSTRIES BUILDING
PENNSYLVANIA STATE COLLEGE
CHARLES Z. KLAUDER, ARCHITECT



Juley

PROPOSED ORCHARD SCHOOL IN INDIANAPOLIS

WALTER DORWIN TEAGUE, DESIGNER

The design of this building has been controlled entirely by consideration for the health and happiness of the children, educational efficiency, structural economy, and simplicity of architectural treatment.

Construction

The structural material is intended to be hollow tile faced with stucco, and reinforced with steel where necessary. Stock windows, doors, folding partitions and stairs are to be used throughout. Resilient floors of inexpensive composition tile are intended, and sound-absorbent ceilings are recommended if the budget permits.

The rooms should be supplied with conditioned air—cleaned, heated and humidified in winter; cleaned, cooled and dehumidified in warm weather. The benefit in improved health of the children should make this an essential feature. Space for air ducts is provided in the corridor ceilings.

Design Features

Classrooms are somewhat diversified in shape and can be treated with varying gay color schemes. Maximum light has been provided by the use of steel sash in large areas.

The main entrance has been planned so that persons entering can pass directly to classrooms on the second floor, to the auditorium or to the basement without disturbing the first floor classrooms. The kindergarten and first grade also open close to this stair well.

The Basement

As the first floor is raised 5 feet above ground, ample light and ventilation are provided for the basement, and the excavation is shallow except for the gymnasium, which has an 18-foot ceiling over an area 56 by 50 feet. The portion of the gymnasium under the dressing rooms is 18 by 50 feet and has a 12-foot ceiling. This part will be available for gymnasium activities while the main floor is used for games.

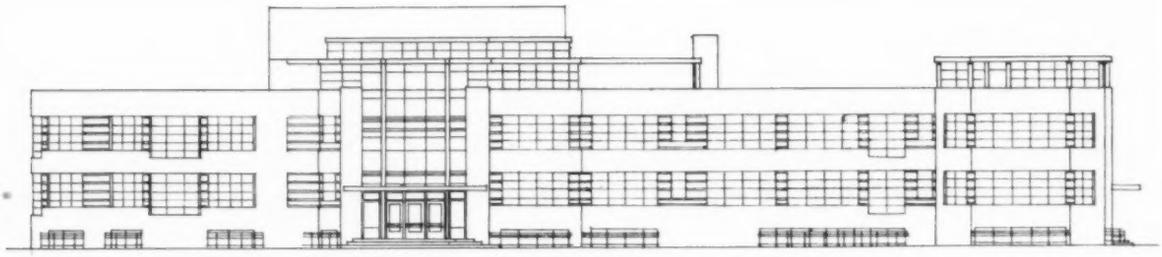
The workshop is at the left of the basement stairs, and it also has a separate entrance for receiving materials. Through this entrance and through the south areaway, the shop has direct access to the stage. Scenery and props can be carried by this route without disturbing the rest of the building.

The two dressing rooms serve both the stage and the gymnasium and there is also direct egress to the outdoors on both sides.

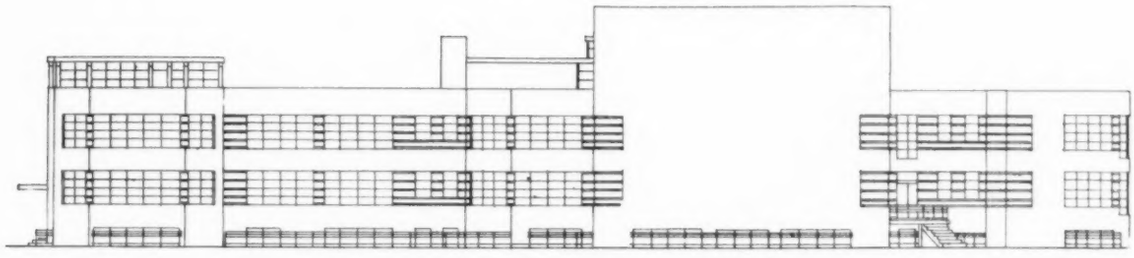
Boiler room, kitchen and pantry are adjoining so that all service is through one area, and only one stack is necessary. The lunch room has its own stairs, and by these one can go directly to the second floor or outdoors without passing through a first floor corridor.

The First Floor

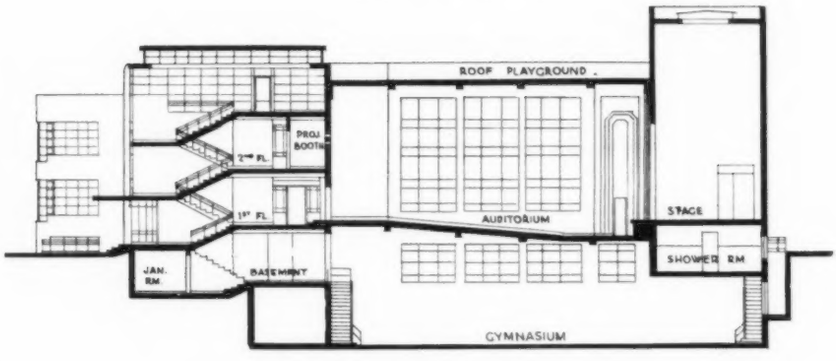
The kindergarten and first grade wing to the left of the entrance is a self-contained unit with its own toilets and storage facilities. This wing has



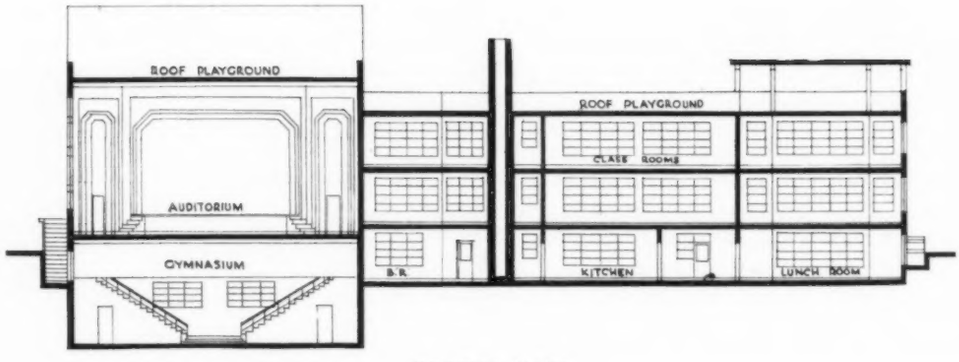
FRONT ELEVATION



REAR ELEVATION



SECTION "B"-B"



SECTION "C"-C"

DETAIL DRAWINGS
PROPOSED ORCHARD SCHOOL IN INDIANAPOLIS
WALTER DORWIN TEAGUE, DESIGNER

exposure on three sides. The little garden and fish pond are enclosed by a 1-foot parapet, and windows at these corners come down to this level.

The auditorium is directly opposite the entrance and thus may be used for public or community functions without disturbing the rest of the building. It has a sloping floor. The proscenium arch is intended to be undecorated and marked only by a series of shallow setbacks. The stage has an ample apron in front of the curtain and steps lead down to the orchestra floor on both sides. A fly gallery is provided, and there are stairs to dressing rooms below. Care has been taken to make this a practical theater for the use of little theater groups as well as for the school dramatic productions.

A moving picture projection booth is at the rear of the auditorium. Movies will be a much greater factor in education in future years, and provision should be made for them.

At the right of the entrance are the reception room and principal's office. These rooms are intended to serve as faculty rooms.

The permanent art room has north and west light. The corridor outside its door is well lighted and might serve as a small exhibition gallery.

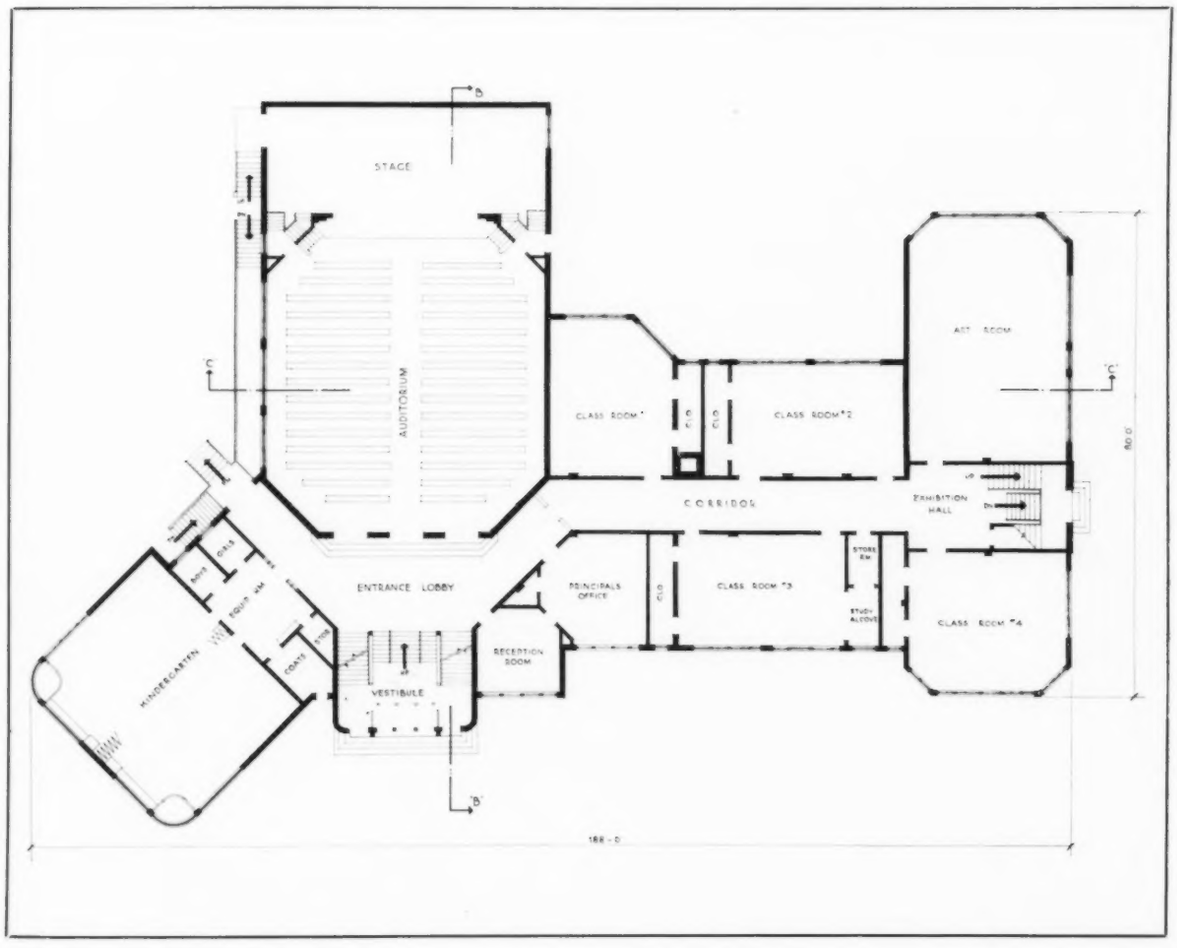
The Second Floor

First grade arrangements duplicate the kindergarten below.

The science laboratory duplicates the art room below, except that it has southern exposure as well as north and west.

The Roof

The entire roof, except over fly gallery, is available for play. Parts (containing stairs) are completely enclosed, others are covered, and the major part is open. The kindergarten wing is largely sheltered from the north and might be reserved for these grades. The enclosed parts of the roof may be used as greenhouses for the studies with seeds and pets which play so large a part in modern elementary education.



GROUND FLOOR PLAN
PROPOSED ORCHARD SCHOOL IN INDIANAPOLIS
WALTER DORWIN TEAGUE, DESIGNER

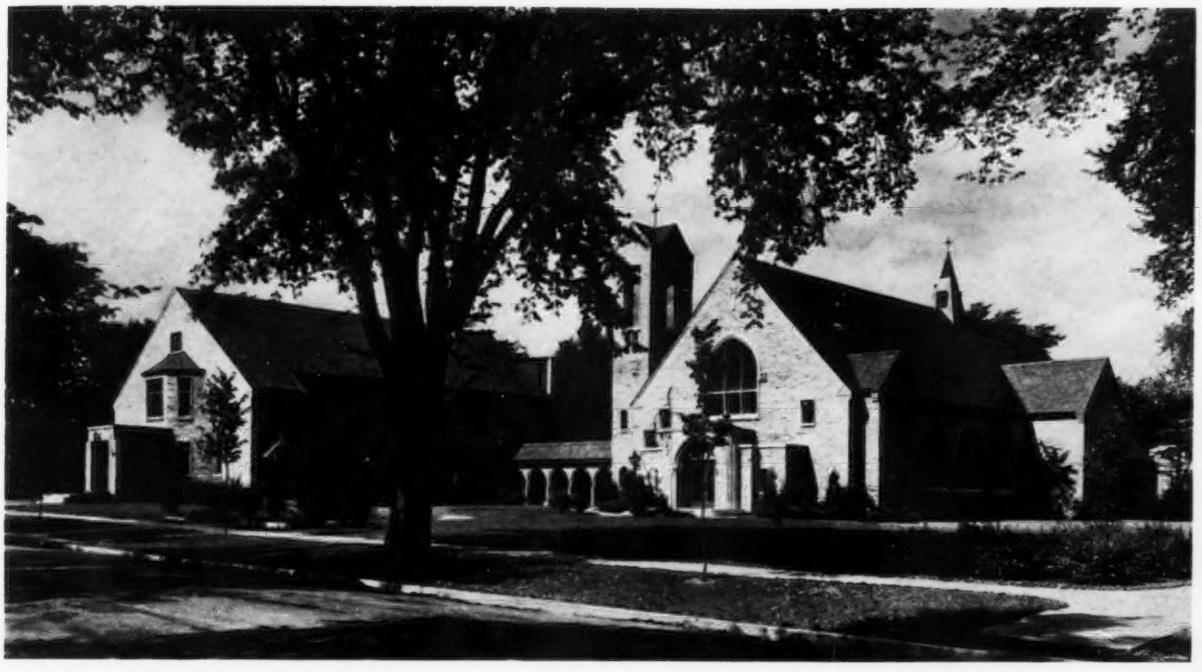
A CONGREGATIONAL CHURCH IN

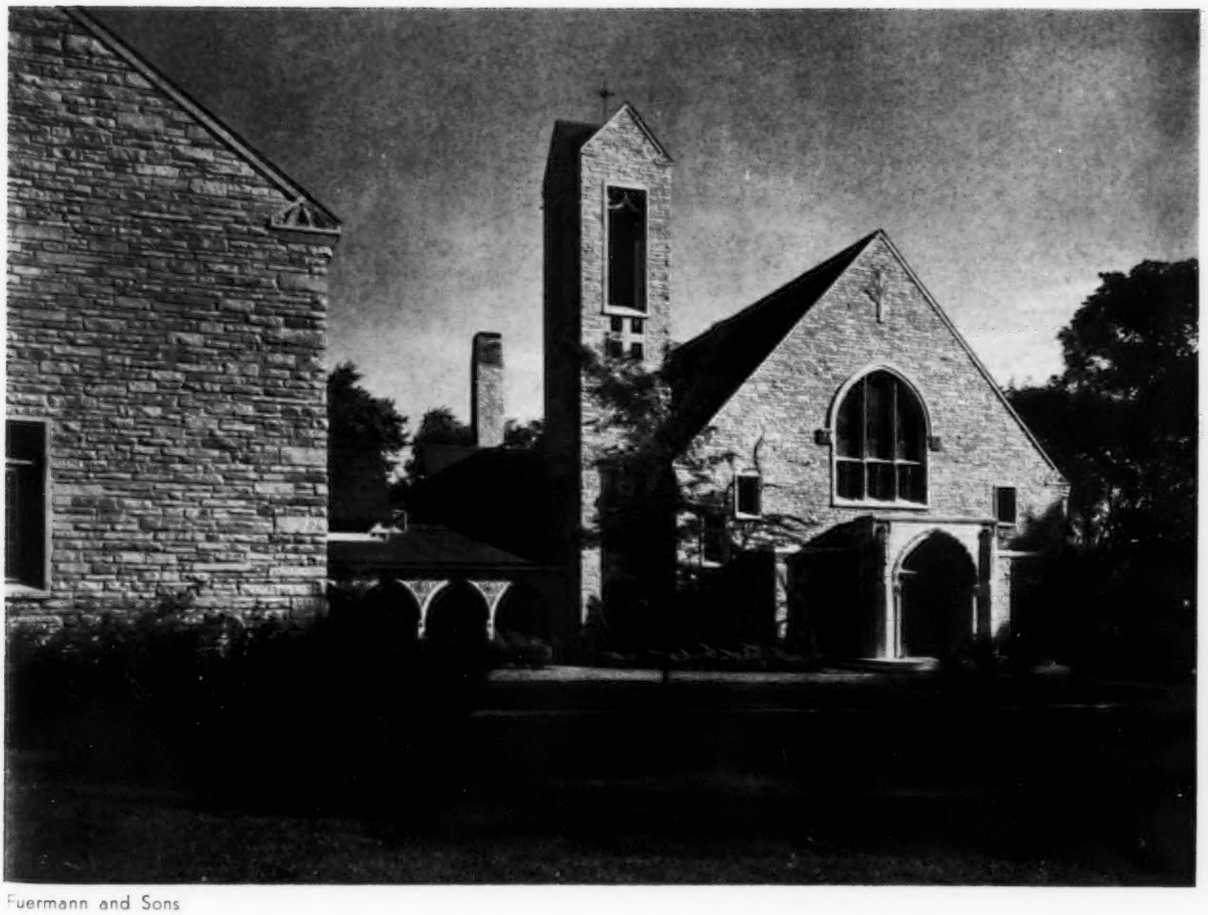
Fuermann and Sons

Outward thrust of roof trusses is counteracted by steel struts in the walls with steel rods going under the floor slab between struts, thus effecting a saving in masonry.

WESTERN SPRINGS, ILL.

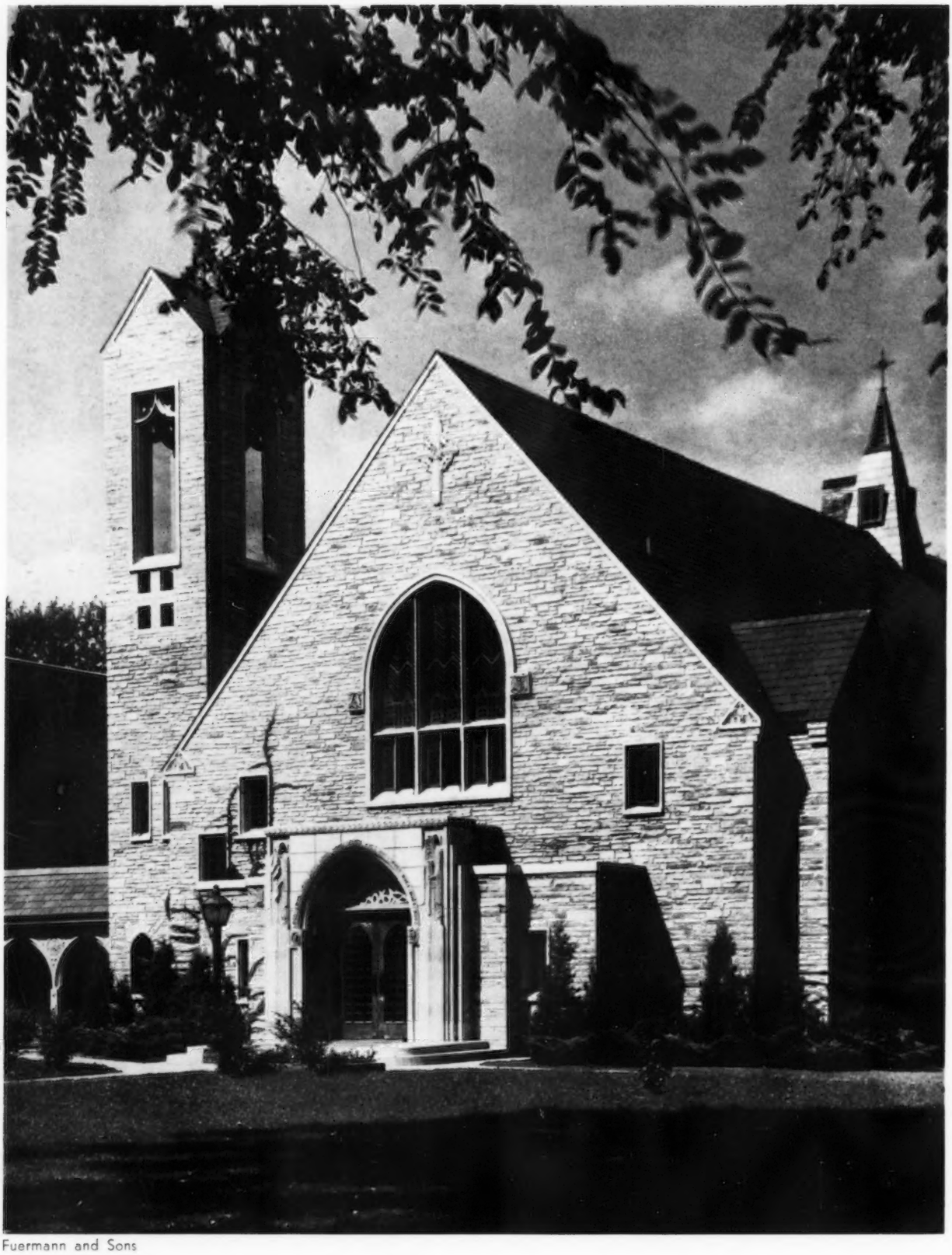
GEORGE G. ELMSLIE
ARCHITECT





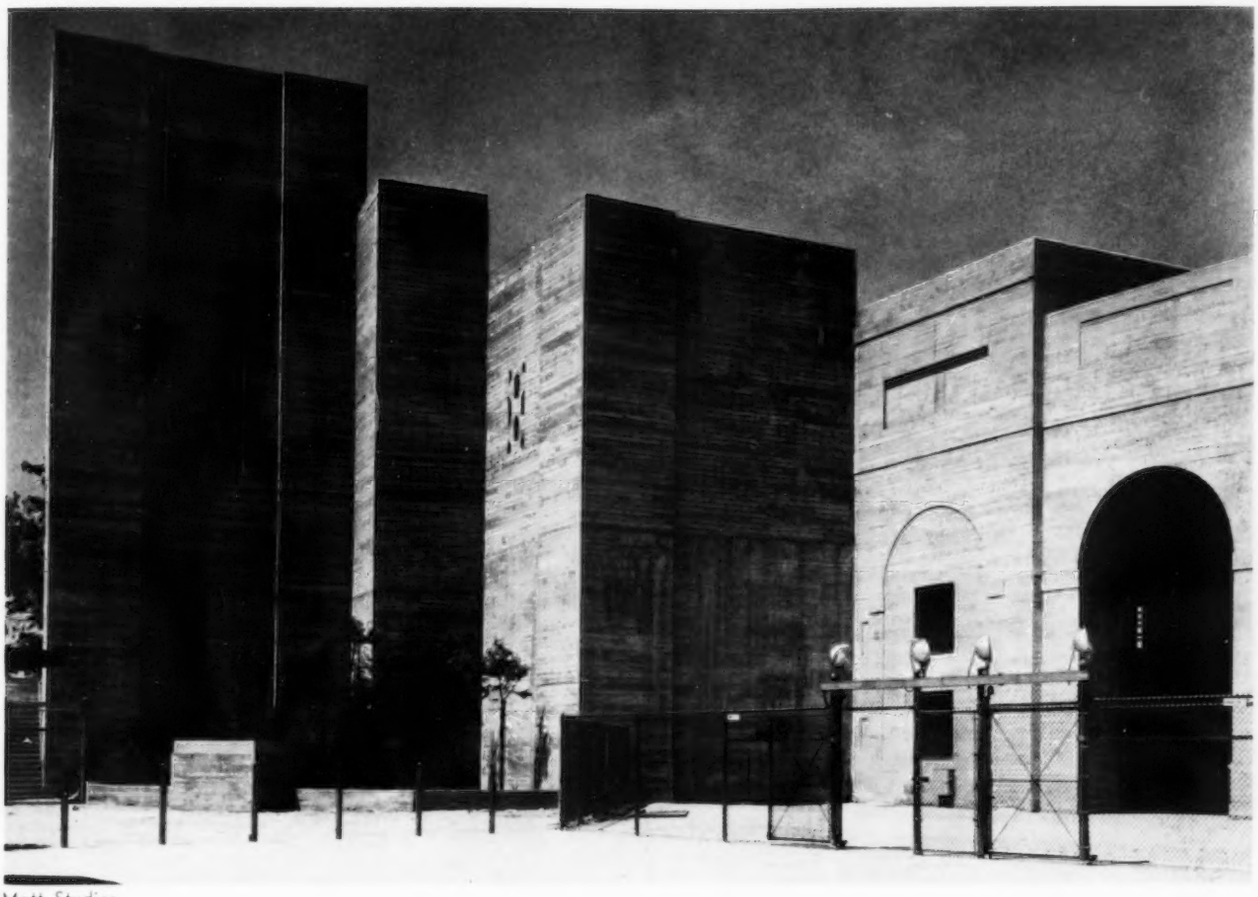
Fuermann and Sons

The weathered stone of the exterior walls comes from quarries near Milwaukee. The church seats 500 persons. It cost, complete, approximately $85,000.



Fuermann and Sons

CONGREGATIONAL CHURCH IN WESTERN SPRINGS, ILLINOIS
GEORGE G. ELMSLIE, ARCHITECT



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OLYMPIC STADIUM IN LOS ANGELES

JOHN AND DONALD B. PARKINSON, Architects

The Los Angeles Coliseum, recently enlarged and completed, has been given a new name, "Olympic Stadium." The stadium is located in Exposition Park, adjacent to the University of Southern California campus. It is equipped for all kinds of athletics, pageants and spectacular entertainments.

The structure, as now completed, consists of three distinct horizontal sections, the lower 30 feet being the original concrete seating, the second section of 35 feet, being new concrete seats built on the old earth fill, and the third or upper section of 35 feet being a supported reinforced-concrete structure. From the field level to the rim of the bowl is 104 feet. The extreme dimensions of the field are 345 feet by 684 feet. The extreme outside width of the structure at the ground level is 788 feet and at the top 756 feet. The extreme length at the top is 1,068 feet; the circumference at the rim of the bowl, excluding the peristyle, is approximately 3,000 feet.

There are 79 rows of seats in a total distance of 225 feet from the bottom to the top of the bowl. Inside the structure and on top of the earth bank completely encircling the bowl, is a concourse 16 feet wide approached from the outside by 28 reinforced-concrete stairways. These stairways and a like number of tunnels form ample facilities for handling the 105,000 persons who may be comfortably seated in the stadium. Arranged around the concourse are 26 toilet rooms. These are in addition to the permanent toilet buildings which were originally built in 1923. There is a separate tunnel from the athletic building direct to the field, and also a large vehicular tunnel approximately 40 feet wide and 27 feet high, thus making it possible to take floats or immense exhibits onto the track within the stadium.

The press box is at the top of the bowl on the south side. This is 180 feet long and contains the radio broadcasting booths, newspaper reporters' booths, official photographers' rooms and telegraph rooms. The radio broadcasting booths have been specially insulated for acoustics.

The complete structure is lighted by 56 electroliers on the rim of the bowl, each carrying two floodlights in addition to the general illuminating lamps and so adjusted that the entire field is lighted with 10 foot-candles; on the football field this is increased to 14 foot-candles, thus making possible night football and other games.

The total cost of the structure was approximately $1,750,000.00.

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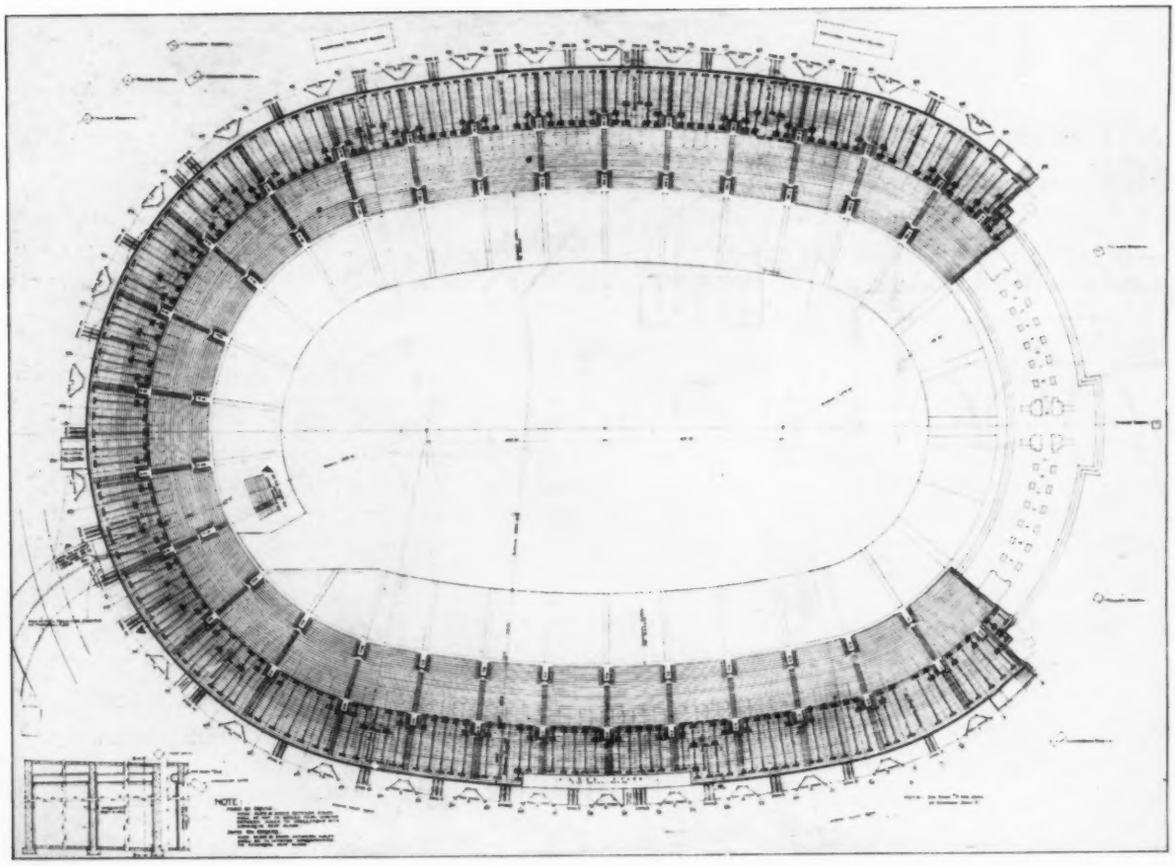
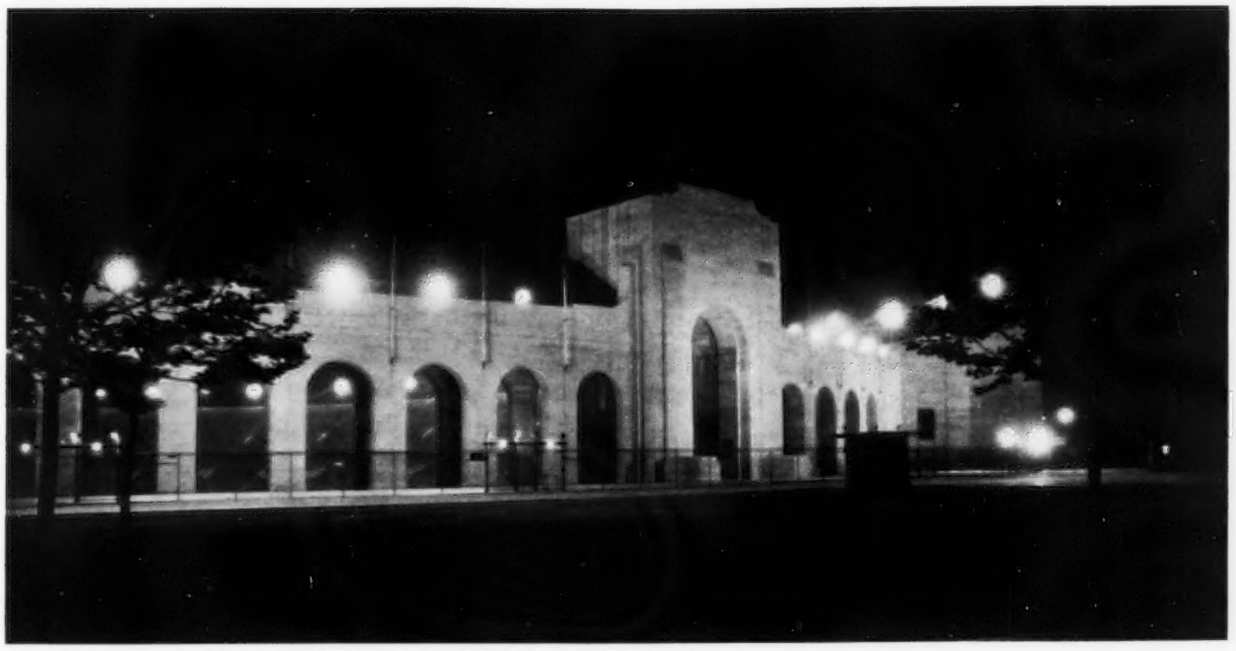


OLYMPIC STADIUM IN LOS ANGELES
JOHN AND DONALD B. PARKINSON, ARCHITECTS



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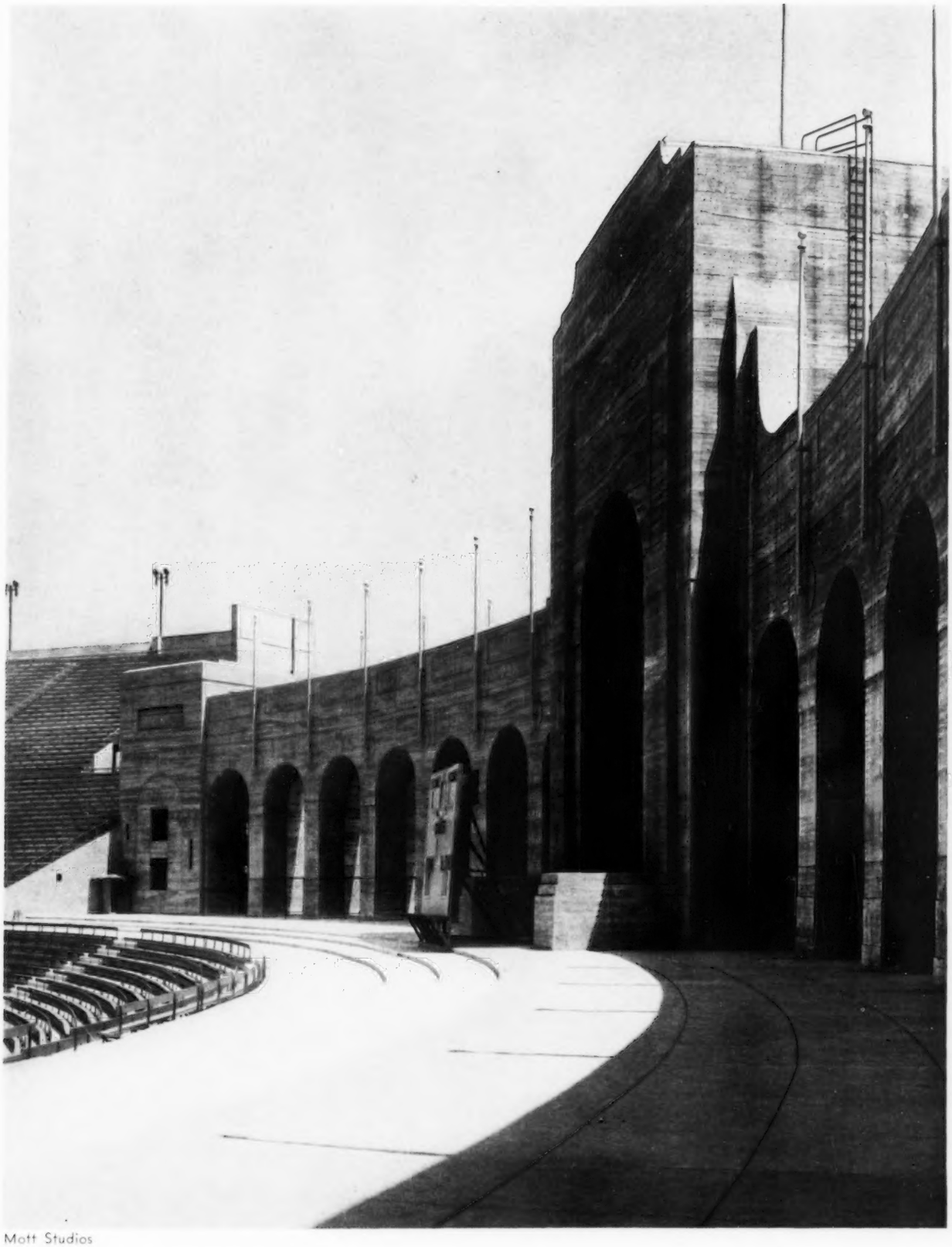

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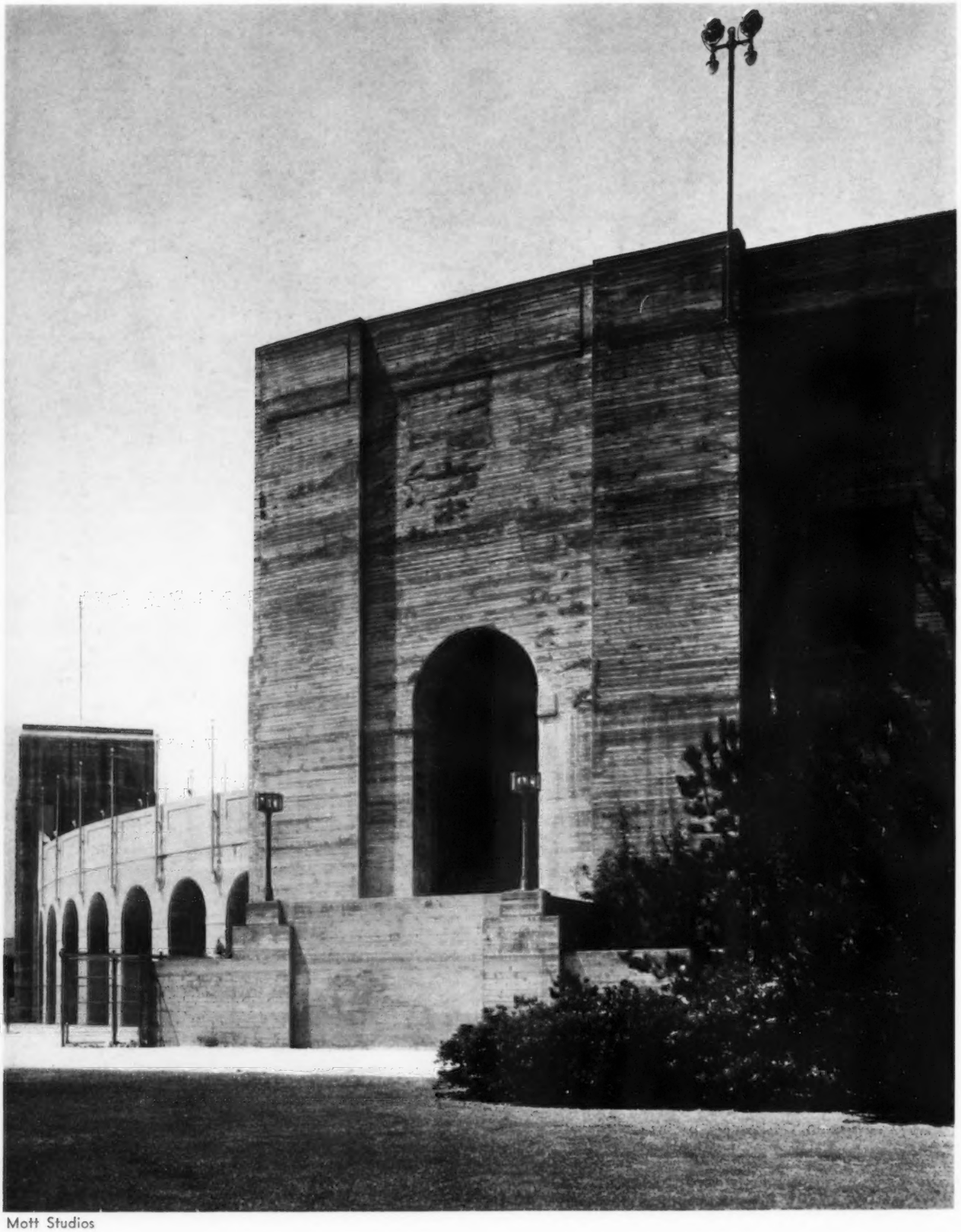
OLYMPIC STADIUM IN LOS ANGELES
JOHN AND DONALD B. PARKINSON, ARCHITECTS



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OLYMPIC STADIUM IN LOS ANGELES
JOHN AND DONALD B. PARKINSON, ARCHITECTS

A SUMMER COTTAGE ON GIBSON ISLAND, MD.

ALEXANDER B. TROWBRIDGE, ARCHITECT

This cottage was designed primarily as a house to be used in the summer months. The client also desired that it be equipped for week-end use in the winter.

Because of a line of hills to the west in Maryland and a flat country between Chesapeake Bay and the ocean, the prevailing winds at Gibson Island come up the bay from a southerly direction rather than from the southwest as usual. Consequently, an L-shaped plan was chosen in order to group in the southeastern corner of the L the rooms constituting the master portion of the house. This arrangement also gives a view over the bay.

The Chesapeake Bay country is hot in summer, and at times it is an absolute necessity to stay indoors for any relief or comfort. Therefore, from the outset, it was considered of fundamental importance in the design of the house to counteract these conditions. It was believed that a direct circulation of air and the protection of the inside of the house from the sun would alleviate this natural condition.

In each bedroom a window has been placed opposite the entrance door, and also across the hall from the door, another window or door; this arrangement permits a direct and unobstructed passage of air completely through the bedroom wing. The living room, which is also used as a dining room in bad weather (the porch serves that purpose at other times), has this same circulation of air along both its axes. Here the ceiling has been carried up two stories in height to give spaciousness, which tends to lower the temperature.

The overhangs projecting from the house over the windows of each floor act as a stationary and permanent awning without the disadvantages of the usual canvas awning, which cuts out the light and renders only half the opening free for air circulation. The total projection of five feet precludes the possibility of any direct sun in the rooms. An exception to this is the living room with its large eastern window.

The soffits of the overhangs are painted white in order to reflect light in the rooms. The tops are covered with a black composition roofing material calculated to absorb the light and prevent any reflection of heat.

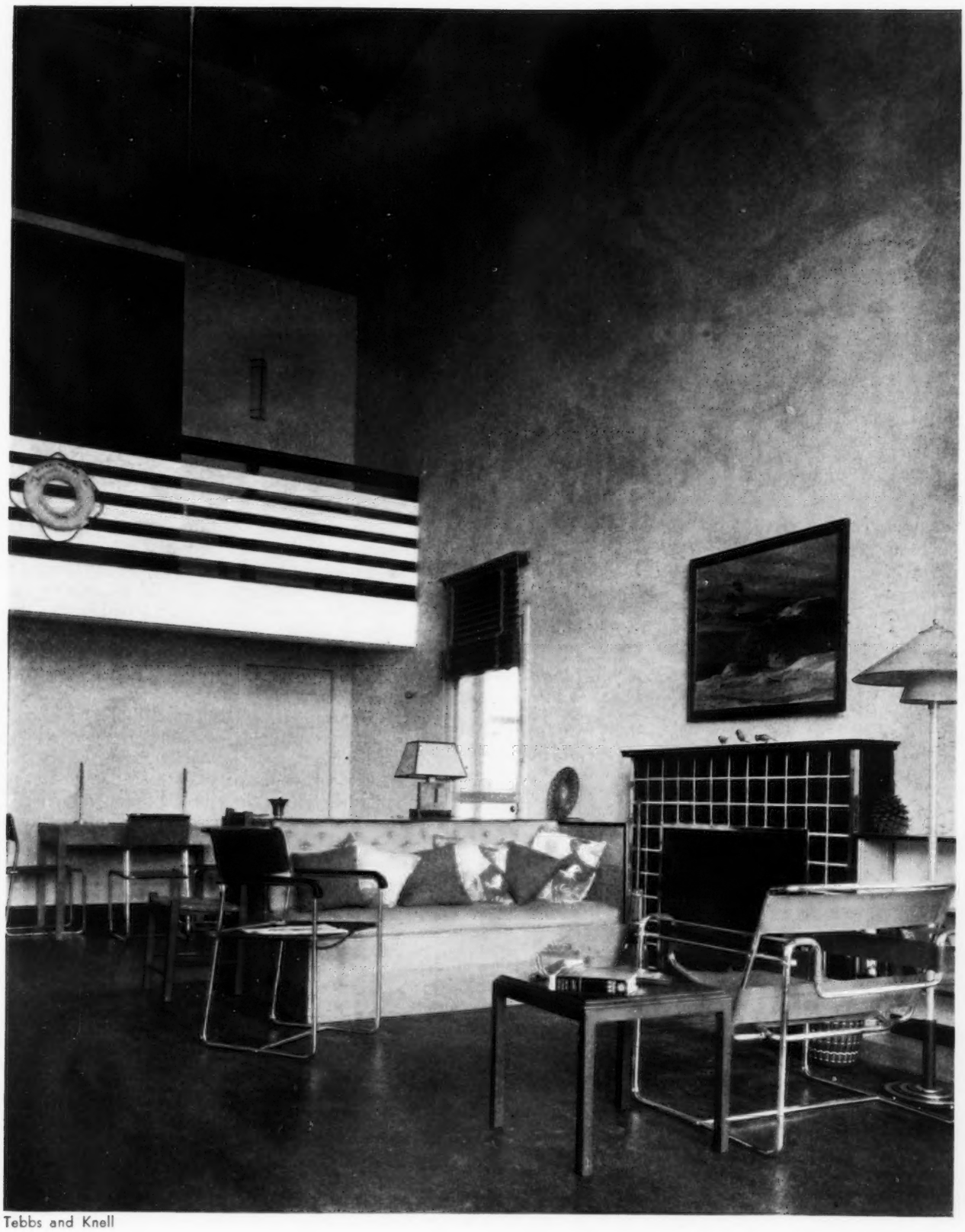
A factory type of steel window divided into two leaves, the bottom leaf hinging on a horizontal mullion, was chosen to secure a maximum open-

SUMMER COTTAGE OF L. CORRIN STRONG
GIBSON ISLAND, MARYLAND
ALEXANDER B. TROWBRIDGE, ARCHITECT

SUMMER COTTAGE OF L. CORRIN STRONG
GIBSON ISLAND, MARYLAND
ALEXANDER B. TROWBRIDGE, ARCHITECT

Tebbs and Knell

SUMMER COTTAGE OF L. CORRIN STRONG
GIBSON ISLAND, MARYLAND
ALEXANDER B. TROWBRIDGE, ARCHITECT



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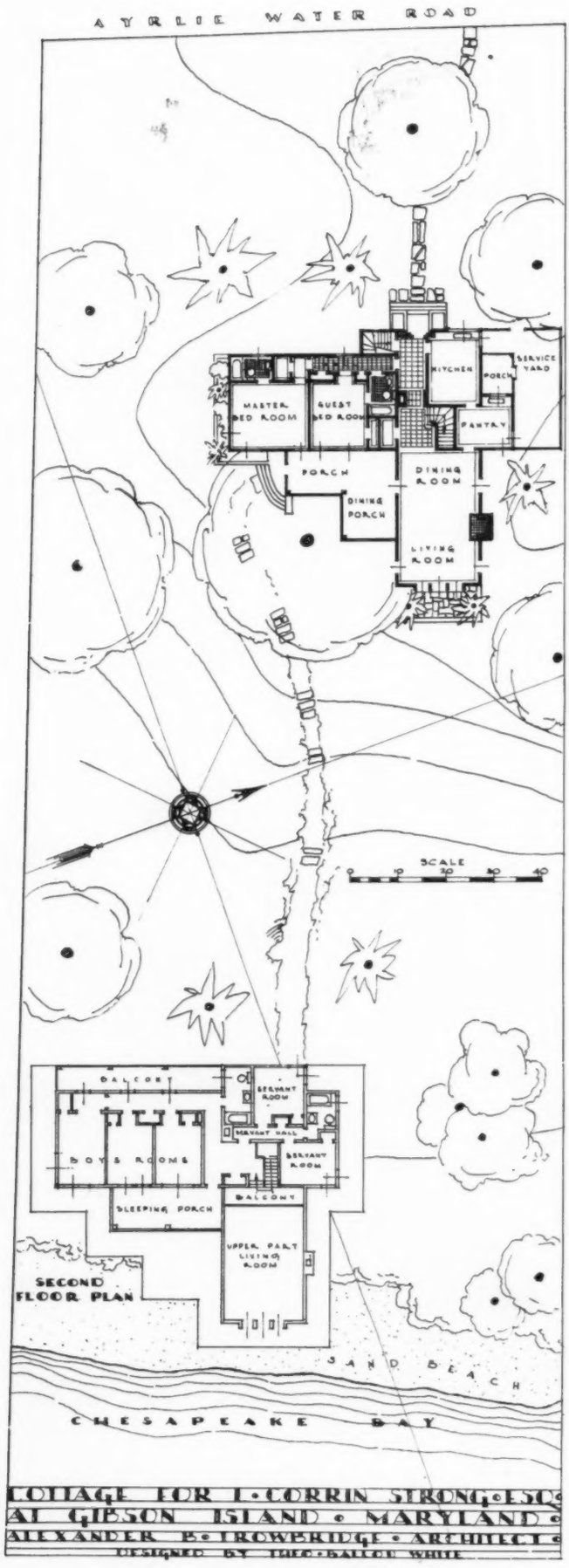
SUMMER COTTAGE OF L. CORRIN STRONG
GIBSON ISLAND, MARYLAND
ALEXANDER B. TROWBRIDGE, ARCHITECT



ing. This type of window can be opened to a horizontal plane and in rainy weather left partly open, affording some protection to the interior against rain.

The overhang on the first floor windows is constructed as a cantilever of the second floor joists, covered on both sides with tongued and grooved boarding. The overhang on the second floor windows is similar in construction, cantilevering from the second floor ceiling joists. Above the ceiling joists is another system of joists forming the roof and allowing entirely unobstructed air space over the entire house. The ceiling of the second floor is covered with insulating board, and the roof rafters are sheathed. The air space between the two is sealed at the sides with sheathing and siding except for several large ventilating louvers.

At a central point in the roof is a flat mushroom ventilator constructed of wood. In the bottom of this a high speed ventilating fan has been installed. This draws air into the space under the roof through the ventilating louvers and expels it through the mushroom ventilator. A pilot light with switch is placed at the owner's bed to indicate when the fan is in operation. It was discovered during the past summer that if the fan is turned on at noontime and left running until bedtime its effectiveness is most noticeable. Experiments made by the architect and client over a period of time on days of similar temperature have demonstrated the efficiency of this method of cooling a house.

The guest bedroom, because of its inside bathroom, is ventilated by the same method. A wood duct (18″ x 24″) was constructed in the second floor closets with an opening in the ceiling of the bathroom and terminating in the ceiling air space. Rough experiments with smoke were conducted when all openings in the room were closed and when they were open, with the fan operating. It was found that except in the most remote corners of the bedroom there was constant movement of air toward the duct. At any place near the door to the bathroom there was a draft strong enough to be decidedly noticeable.

The house is constructed of 2″ x 4″ studs on concrete block piers. Diagonal sheathing and shiplapped siding of cypress form the outer covering. This was stained a brown, slightly weathered. Strips ⅞″ x 1½″ cover all joints in the siding. The strips on the overhangs are wood, painted before application. All exterior walls are insulated with ½″ composition board. In the living room this board has been plastered. Elsewhere it was left exposed. The roof is covered with a tar and gravel roofing.

The interiors are simple, with painted surfaces. Some of the furniture is aluminum.

A hot-air heating plant has been installed for winter week-ends, with registers only on the first floor. This system is thermostatically controlled but relies largely on recirculating the air in the house through the heater rather than on introducing cold air direct to the furnace.

WHAT DOES THE ARCHITECT KNOW ABOUT SMALL HOUSE COSTS?

By HENRY WRIGHT, Architect

Architects have had to do with only about 3 per cent of small house construction for two particular reasons:

(1) In the small house as produced for the overwhelming majority of our population, there has been little or no attention to proper design.

(2) The architect has not known as much about the economical production of the small house as his successful rival, the builder.

The architect is equipped to design our ideal free-standing single-family house. But while the architect is looking for new work the commercial builder continues to perpetuate row upon row of bleakly repetitive houses, often jerry-built and nearly always jerry-planned. Whether they be starved little single-family houses or the usually even less desirable two-family dwellings or flats, they are alike in their substitutions of gadgets and trick equipment for good planning and the basic amenities of sunlight, outlook, air and privacy.

The builder has managed to serve in rough fashion a lower economic group than has usually been reached by dwellings produced under architectural supervision. Yet the commercial builder, although he has usually operated on a basis of quantity production, has failed to apply the principles or to gain the benefits of large-scale operation. The architect, on the other hand, working as an individualist in a higher-priced field, has had too little knowledge of the problems and opportunities of large-scale production.

Analysis is required to solve the small house problem. The economic factors are dominantly important, and among these the single aspect of analytic cost-accounting can revolutionize many of our conceptions about small-house design.

Analysis, in showing the elements contributing to cost, will indicate which factors can be varied, within known and controllable limits, for economic soundness, for flexibility of planning, and for the benefit of the ultimate consumer.

Study of House Costs in Large Developments

In seven years of breaking down house costs* with the help of systematic accounting methods and time studies in the field, it has been found not only that common brick costs from $30 to $70 per thousand in the wall, but in just what parts of the building the brick costs one amount or the other. The cost of a block party wall as compared to a brick end wall has been learned, and also the difference between a party-wall chimney for one family or for two. Other cost factors of basic use have been the difference in cost between hip and gabled roofs, or pitched and flat roofs. In certain cases, these actual differences varied 1000% from the builder's time-honored "rule-of-thumb" calculations.

The next step has been to take the actual costs in detail of a house located in the middle of a row, and then determine what would be the costs if the same house stood at the end of a row, or if it were free-standing, or if the plan were altered for use as a flat. It was found that predictions registered within 2% or 3% of actual costs. An important factor contributing to accuracy was the use of a uniform plan depth (28′ 4″) and cross section in almost the entire product of this period of study.

This increasing familiarity with costs has led to a classification of all items as roughly constant or variable within similar classes of dwellings.

Principle of Constant and Variable Costs

It is often claimed, and with good reason, that a cubic foot basis of comparison doesn't mean much and that specifications vary so extensively that exactly the same house design will show a difference in cost of 20% to 30% and will be different in every city and from one year to the next. Granted! You can't use a cubic foot basis to express costs if noncubic things, like plumbing or stairways or the baby carriage, are to be included.

But by setting up a series of *constant items* which occur uniformly in houses of the type under discussion, and deducting these items from the total construction cost, we approach a more rational basis for cubage estimates of the really cubic factors. These constant items, occurring in all compact single-family houses, whether row, semi-detached, or free-standing, are:

(1) Heating plant (except radiation).
(2) Stairs.
(3) One plumbing outfit with related kitchen and bathroom fixtures.
(4) Tiling or other finish for one bathroom.
(5) Kitchen equipment.
(6) Utility connections.

In houses of the three largest projects in this study which have cost about 30¢ a cubic foot (28¢ without overhead), the total of these items may be taken as roughly $1400 a house ($1420 in Table "B").

*The figures given in this article are based on several types of single-family and two-family houses of uniform depth (28′ 4″) and varying width, built of brick, wood-joist construction, at Sunnyside, Radburn, and Pittsburgh.

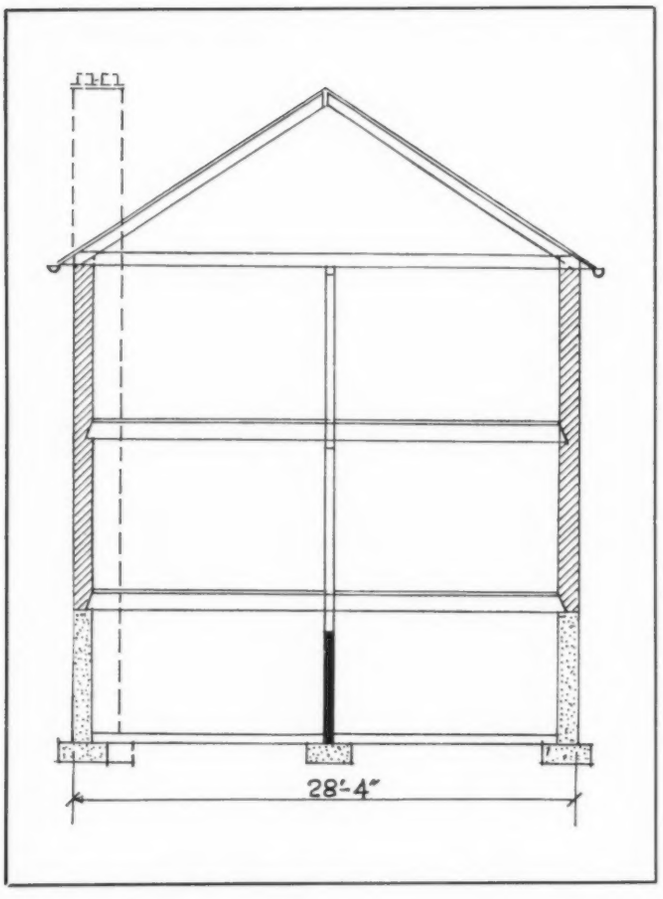


DIAGRAM A

SECTION TO ILLUSTRATE STRUCTURAL SHELL, DIVIDED INTO BASIC AND SECONDARY CUBAGE.

The construction shown here is the **basic cubage,** consisting of front and rear walls, floors, bearing partition and roof with their respective finishes. This represents a continuous shell of indefinite length before being divided into row or other types of houses, similar to a length of sausage before the individual "pigs" are formed. (The lineal foot cost of every item in this section is known within a close approximation — including variations of brickwork costs in first and second stories, differences between pitched roof and flat roof with parapets, etc.)

This cubage costs 12¢ per cubic foot out of a total of 30¢ per cubic foot, or about $100 per lineal foot of girder length in houses of the type and size discussed.

Secondary cubage consists of all other construction (except "constant items") for the purpose of dividing and articulating the individual houses, namely: party walls and interior non-bearing partitions and their finish, together with doors and windows. This represents a cost of 8¢ per cubic foot, for forming the individual "sausages," making a total of 20¢ per cubic foot for general cubage cost, exclusive of "constant items."

It will be seen that the 12¢ item is the only portion of the cost affected by changes of a few feet in width of house which do not require changes of plan arrangement or additional fenestration. (See text for consequences of this fact.)

The *structural shell and general finish* of the house—properly related to the cubage—has been found by experience to cost 20¢ a cubic foot in the various medium-size houses produced with the standards noted. This 20¢ was found by further analysis to consist of:

(1) 12¢ for *general or basic cubage* (construction shown in Diagram "A")—all construction (with finish) included in a section through the house to avoid doors, windows, party-wall nonbearing partitions, or any of the constants listed above.

(2) 8¢ for *secondary construction*—the division or articulation of the structural shell, which includes party walls, minor partitions, doors, windows, and the like.

Example of Actual Costs

Let us take a 6-room interior row house, 20′ x 28′4″x30′ (average height), or 17,000 cubic feet, to cost $4820 for the complete building without porches or allowance for overhead. Of the 28¢ a cubic foot, 8¢ or about 29% represents constant items, such as plumbing, boiler, stairs; 8¢ more represents the cost of adding doors, windows, interior partitions and party walls to the bare structural shell as represented in Diagram "A"; 12¢ represents this shell complete. That is, if we took a slice through the building from front to back, but missing partitions and doors, we would have 1′ x 28′4″ x 30′ or 850 cu. ft. at 12¢ a cubic foot or $102 a lineal foot of building. Actually this cost was $92 (or 11¢ plus) at one period at Sunnyside and $97 (or 11½¢) more recently at Pittsburgh.

Twelve cents to include contingencies is a fair figure. This becomes particularly significant when it is seen that 12¢ a cubic foot is the only portion of the total cost which varies when the house is widened or narrowed within a range of a few feet and does not require changes of plan arrangement. It was found in Pittsburgh that a house 18′6″ wide, which would have cost $4900, could be built 2 feet wider for $191 more or for a total of about $5100. That is, for 3¾% greater cost more than 11% of living space was added. Two more feet were added to the width of two main bedrooms, the living room and dining room at a cost of less than $48 a room. There was a slight added cost for land—in this case about $25 a house.

Now let us examine the other variable factors. To obtain the cost of an interior row house of any size when converted to an end row or semi-detached or free-standing house, it is only necessary to add the known differential for an exposed end wall, cornice, windows, etc., in place of a party wall; or in the case of a free-standing house twice this amount plus the cost of an individual rather than a shared chimney (see Table "B"). The additional width of lot is figured uniformly at about $40 a front foot. Free-standing walls require 6″ extra width of house.

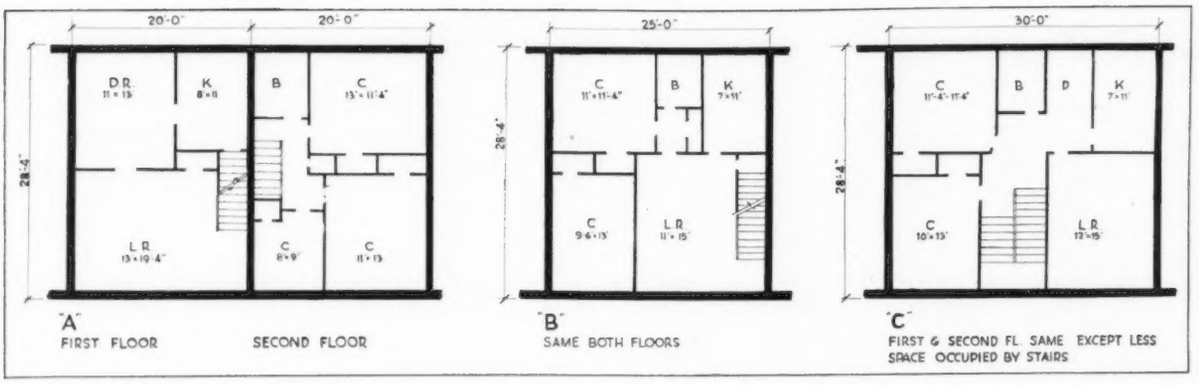


TABLE B	(A) SINGLE-FAMILY HOUSE			(B) SERVICED 2-FAMILY HOUSE (d)			(C) NON-SERVICED 2-FAMILY HOUSE (e)		
	Interior Row	End Row or Semi-Detached	Detached House	Interior Row	End Row or Semi-Detached	Detached House	Interior Row	End Row or Semi-Detached	Detached House
Size	20x28.4	20.6x28.4	21x28.4	25x28.4	25.6x28.4	26x28.4	30x28.4	30.6x28.4	31x28.4
Cu. Ft. @ 20¢	17,000	17,425	17,900	21,240	21,665	22,140	25,500	25,925	26,400
Net Cubage Cost	$3,400	$3,485	$3,580	$4,248	$4,333	$4,428	$5,100	$5,185	$5,280
Uniform Items (a)	$1,420	$1,420	$1,420	$1,420	$1,420	$1,420	$1,420	$1,420	$1,420
End Wall	....	$450	$450	....	$450	$450	....	$450	$450
End Wall, Half Chimney	....	....	$515	....	....	$515	....	....	$515
Double Equipment (b)	....	....	....	$775	$775	$775	$1,200(y)	$1,200	$1,200
Total Building Cost	$4,820	$5,355	$5,965	$6,443	$6,978	$7,588	$7,720	$8,255	$8,875
(L) %	**100**	111	124	**100**	108	118	**100**	107	115
Lot Size	20x100	30x100	35x100	25x100	35x100	40x100	30x100	40x100	45x100
Lot Cost, Improved (c)	$840	$1,270	$1,475(x)	$1,060	$1,450	$1,655(x)	$1,270	$1,630	$1,835(x)
Total Cost	$5,660	$6,625	$7,440	$7,503	$8,428	$9,243	$8,990	$9,885	$10,710
Cost per Family	$5,660	$6,625	$7,440	$3,751	$4,214	$4,621	$4,495	$4,962	$5,355
(M) %	**100**	117	131	**100**	112	123	**100**	110	119
(N) %	76	89	**100**	81	91	**100**	84	92	**100**
(O) %	**100**	117	131	66	75	82	79	87	95

(a) **Uniform Items:** Stairs, heating (except radiation), plumbing stack and fixtures, bath tiling, kitchen equipment. Porch costs omitted from all types.
(b) **Double Equipment:** Extra bath and kitchen, special stairhall.
(c) **Lot cost is based** upon land at 10¢ per square foot in lot, with all public improvements and yard work amounting to about $40 per front fot.
(d) Serviced 2-family house is one in which first floor occupant provides heat, hot water and janitor service for second floor.
(e) Nonserviced 2-family house is one with separate heating plants and separate basement stairs.
(x) $25 added to basic front foot cost of any lot for free-standing house for side yard improvements.
(y) Extra heater and special stairs.

It has been found that within the margin of 2% or 3% the same procedure and cost items could be applied to two-family house types planned to the same depth, by adding known constants for double equipment of bathrooms, kitchens, special stairs and heating plants (see Table "B").

Granting the general accuracy of these facts, we may now test their significance in certain important respects. Extensive study as well as experience has now established a differential in construction cost alone of about 10% or 11% more for the semi-detached than for the row single-family house, and about 22% to 24% more for the fully detached (see "% L" in Table "B"). That is to say, a 20′ wide by 30′ deep house (brick, slate roof, joist construction) changed from a party-wall row to a free-standing position adds 24% for building, and with land from 30% to 33% (% M) if the detached houses are placed a decent minimum of 14 feet apart. The variation of 3% will allow for a raw land at $2000 to $10,000 per acre.

Allowances for Changing Price Levels

The practical significance of these data was fully borne out in the studies made for the Buhl Foundation project in Pittsburgh (shown in the October issue of *The Architectural Record*), where not

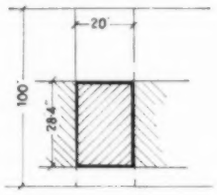
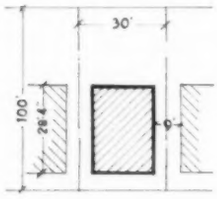


DIAGRAM C

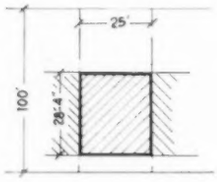
THE PROBLEM:

Given an interior row house with a lot 20 by 100 feet, to cost $5,660 without carrying charges or selling costs: How can a better house be gained by spending an additional $750?



THE SOLUTION:

To set the house on its own lot 30 by 100 feet with only 9 feet for both side yards will cost $450 plus $515 for house and $455 for lot. The gain will be a few windows on narrow side yards, looking into the neighbors' houses and an expenditure of $670 more than was desired.
(See Table B including note "X".)



To add 5 feet to width of house in a row group will add $500 for building, $220 for land. Allow $30 for more windows, or a total of $750. Result: $750 spent as expected, 25% more room on both floors of the house, and maximum window exposure on open spaces.

only did contractors' figures check very closely with estimates analytically arrived at, but where the demonstration of the row house as a superior form of low-cost dwelling was so conclusive that the character of the entire project was changed from the original scheme of free-standing houses to a development of group or row houses.

Widths of houses in this project were adjusted in the light of figures cited above so as to eliminate the narrowest types which had been demonstrated to be economically unnecessary and undesirable.

Diagram "C" shows in an even more striking way the economy and superior amenity of the row house and illustrates how analytical cost data enable one to forestall misguided planning and the ineffectual expenditure of money.

It will be noted that practically uniform prices are used here for three projects spread over a period of seven years and running into 1931, whereas there is at present considerable emphasis on the lower level of building costs. It so happens that figures received for the latest of these three projects checked almost exactly with the experience of those previous. This fact simplifies and strengthens the analogy. The important thing, however, is not that the costs of these three projects agree in detail at a particular level, but that an analytical outline for cost comparison has been deduced—an outline to which lower, higher, or changing costs can be intelligently related. Equipped with this approach, the architect is in a far better position than before to cope with new price levels; for in having segregated the elements of cost* into their true "spheres of influence" he can better project the effects of changing costs for any element or group of elements.

*In actual work these groups of cost factors will be broken down in much greater detail than has been practicable in this general presentation of the principles. For example, the author's data on which Diagram "A" is based contain the detailed costs per lineal foot of girder length for some 35 items comprising the $100 per lineal foot (approximately) for structural shell costs. These items range from footings and Lally columns, through rough and finish flooring, exterior walls, plastering of surfaces in the "shell" proper, roof framing and roofing, gutters, etc., with variations for brickwork cost in first and second stories, and differences between pitched roofs or flat roofs including parapets, etc.

Advantage of the Row House for Large-Scale Construction

While analysis can show a theoretical cost advantage, experience can substantiate another major advantage in the group house. The detached house becomes less feasible the more we apply large-scale methods to construction. Watch the antics of a steam shovel even where a number of detached houses are built in a row. The group house *is* large scale, although its units are for small-scale use. On the other hand, analysis is beginning to indicate that we may easily overdo largeness. Large block developments of even the best "garden apartments" require costly central heating installations which, while efficient in maintenance, add largely to carrying charges in capital investment. New methods of heat directly applied through either gas or electricity, which may greatly alter our present methods and will be to the advantage of the relatively smaller type of group dwelling seem to be on the way. The efficiencies and inefficiencies of present types of multi-family dwellings (about 60% of present construction in larger cities) offer a wide field to the architect who cares to add an analytical approach to his services.

REMODELING—AS AN INVESTMENT

By THOMAS WILLIAMS, Architect

Owners of unprofitable property are seeking new uses for their property with a minimum outlay of capital. In order to obtain profits at present rentals, methods for cutting costs are being investigated. In this effort an old method—alteration—deserves consideration.

Forms of Alteration:

Modernization—adding modern facilities to existing accommodations.

Alteration in occupancy—increasing or decreasing number of units, e.g., splitting up 7-room into 3-room apartments.

Alteration of purpose—changing use of building.

Factors—Pro and Con:

Structure in good condition.	Land value may far outweigh building value.
Plan susceptible of redivision to suit changed demand.	Structure of type unsuited to changing needs of district.
Vendor of run-down property may give long time purchase money mortgage and subordinate at completion of project.	Limitation imposed by existing structure upon size or shape of units and exterior design.
Survey and complete specifications minimize unforeseen items.	Allowance for unforeseen necessities.
Greater speed of altering as compared with rebuilding reduces carrying charges to minimum.	Difficulty of obtaining reasonable institutional building loans on alterations.
Smaller demolition costs.	

Existing buildings often cover more of the lot than is now permitted by law for new buildings. The small courts and yards which result from this greater ground coverage are undesirable and insanitary under bad management and low type occupancy. Good planning and higher class management and occupancy may convert such bad features into assets by development as garden areas and by improvement of ventilation and daylighting. The greater area of the building then increases the financial return.

Pioneering in run-down districts presents an opportunity for remodeling. Here the property may often be purchased for its land value. In areas of concentrated land value vertical development through high buildings is effective in developing plots. Horizontal development—alteration of comparatively low buildings—in large projects offers the possibility of improving blocks as well as buildings. Quiet and seclusion for tenants can be secured in such developments, and greater opportunity exists for profit on the larger area of land involved.

Van Anda

ENTRANCE TO A REMODELED APARTMENT HOUSE, FORMERLY A TENEMENT, IN THE GREENWICH VILLAGE SECTION OF NEW YORK CITY

Considerations in Remodeling

(1) The correct analysis of a rebuilding problem, as of a new building problem, begins with a study of the needs of the community. After determining the type of building needed by the community, consider which district offers most advantages.

(2) In considering the site, remodeling should be weighed against new building, bearing in mind that even though remodeling may be nearly as expensive as new building, a difference of even a small percentage in the cost may make a great difference in the profit from the operation to the holder of the equity. Economy in alteration comes from the maximum retention of existing conditions. There is always a compromise between this fact and the necessity for bringing the structure up-to-date. Semi-alteration is usually simply a postponement of a problem.

(3) Importance of study of lot survey:

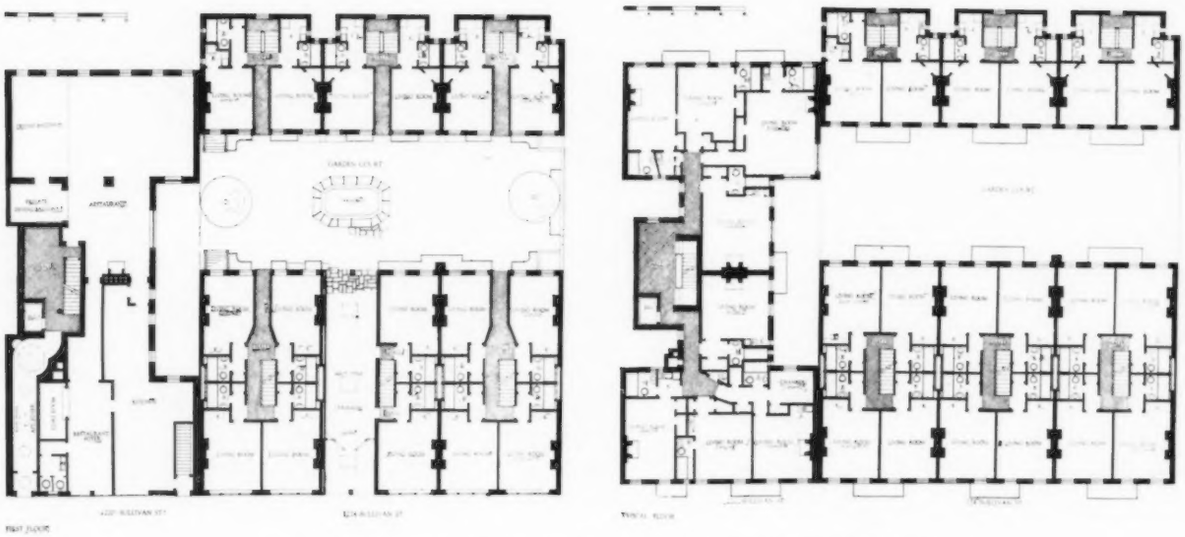
(a) Small space behind building may save shaft construction.

(b) Danger of encroachments on street. Even application of stucco may make existing encroachment excessive.

(c) Classification of building in city departments.

(d) Possibility of landscaping.

Van Anda



APARTMENT HOUSE AT 220-224 SULLIVAN STREET, NEW YORK CITY
REMODELED BY THOMAS WILLIAMS

The interior yard of the old tenement properties has been changed to a garden court with stone flagging, a pool, trees and flowers. Entrance to all apartments is from this garden.

Van Anda

APARTMENT HOUSE AT 220-224 SULLIVAN STREET, NEW YORK CITY
REMODELED BY THOMAS WILLIAMS

The buildings around the garden court have been painted in different colors. Minimum exterior change has been attempted. All the remodeling has been directed toward low rentals and a high class occupancy.

John Keller and Son

New and old views of apartment house (90 per cent rented) on Morton Street, New York City, remodeled by Thomas Williams.

John Keller and Son

(4) Accurate building survey reduces danger of unforeseen contingencies.

(5) Complete specification more important in remodeling than in new work, because items not specified to be changed are assumed to remain.

(6) Small one and two-room apartments:

(a) Renting season less important than in large apartments, since prospective tenants, often from hotels, have no leases. (224 Sullivan Street, opened in March, 1931, was 76% rented in June.)

(b) Higher cost of construction. Higher return from building.

(c) Importance of cross ventilation. A difficulty with small units. Cross ventilation impossible to secure in one-room apartments in large new buildings except by louvers in doors. Shafts existing or easily created in old buildings give excellent cross-draft.

(7) Miscellaneous considerations:

(a) Soundproofing.

(b) Fumigation with hydrocyanic acid gas often wise precaution.

(c) Showing of apartments in early stages of work not recommended.

Case Study in Remodeling

The alteration of 220 and 224 Sullivan Street, New York City, was studied from its initial stages by real estate agent, contractor and architect in collaboration. Site in Greenwich Village section a short distance south of Washington Square. Development of Washington Square section in other directions led to belief that development south would follow.

A survey showed much alteration in Greenwich Village section but on smaller scale. Many alterations for two-room apartments, but few buildings are convenient to alter into one-room apartments.

Planning based on:

(1) Fundamental theory of large demand for a small unit to appeal to small purse (hotel accommodations, not housekeeping).

(2) Greater independence of apartments.

(3) Belief in appeal of quiet simple design to high class tenancy.

The two buildings were altered at different times. 220 Sullivan Street was a five-story tenement building with 40-foot frontage; legal for 8 apartments on a floor. 224 Sullivan Street consisted of three five-story tenement properties of 25-foot frontage, each with a front building and a rear building, separated by a yard 28 feet deep; each property legal for 6 apartments on a floor. The interior yard, by allowing three outside exposures (two on yard and one on street) made a good arrangement for small units.

The three existing 3½-foot entrances to the buildings of No. 224 were closed, and a new 11-foot fireproof passage to the garden constructed. Entrance to all houses is from this garden, the development of which through stone paving, pool, trees

and planting of flowers, is the keynote of the alteration. The buildings around the garden are painted in different colors.

Minimum exterior change has been attempted. On street, new first story in blue stucco replaces old store fronts. Upper stories painted warm gray. Fire escapes painted (balconies black, vertical ladders to match building).

Sacrifices have been made to keep rentals low. Living rooms are small. Closet space is not as large as desirable. Most apartments have kitchenette in living room. Sheetrock partitions.

Justification for premises upon which alteration was based is seen in fact that the buildings are 87% rented in very bad year. Appeals to high class occupancy.

Analysis of Costs

Cost of alteration of 220 and 224 Sullivan Street in cents per cubic foot:

Carpentry	9.6c
Masonry	4.6
Plumbing	9.2
Heating	1.9
Painting	2.5
Structural steel and misc. iron	1.4
Rubbish removal	.8
Misc. subcontracts (electrical, roofing, hall floors, tiling, etc.)	7.3
Garden work, planting and trees	.3
Electrolux refrigerators and stoves	3.9
Otis elevator and shaft (in No. 220)	1.1
	42.6c

Are these costs high? Average cost of brick, 5-story walk-up apartments in New York for last half of 1930 was 38 cents per cubic foot. Such apartments would probably average at least 3 rooms.

Cubic foot costs are deceptive. Certain work included above often omitted from such figures, e.g., garden, refrigerators, stoves, elevator.

One-room apartments are expensive because of the multiplication of elements.

At 220 and 224 Sullivan Street:

	Cost in cents per cubic foot
Plumbing	9.2c
Refrigerators and stoves	3.9
Kitchen cabinet work	.9
Tile floors in baths	.5
Fireplace work	.5
	15.0c

This cost varies inversely with the number of rooms per apartment. For three-room apartments with the same average size of rooms these items would be 5 cents per cubic foot.

Carrying charges on this job with average of 5 months for construction were 2.1 cents per cubic foot. With new building on same land, costing the same amount and taking 10 months from beginning of demolition, these charges would be doubled, 4.2 cents per cubic foot.

Rubbish removal included above at 0.8 cents should be compared with an estimated cost of demolition of these buildings of 1.25 cents. (Demolition is not included in cubic foot costs.)

Van Anda

John Keller and Son

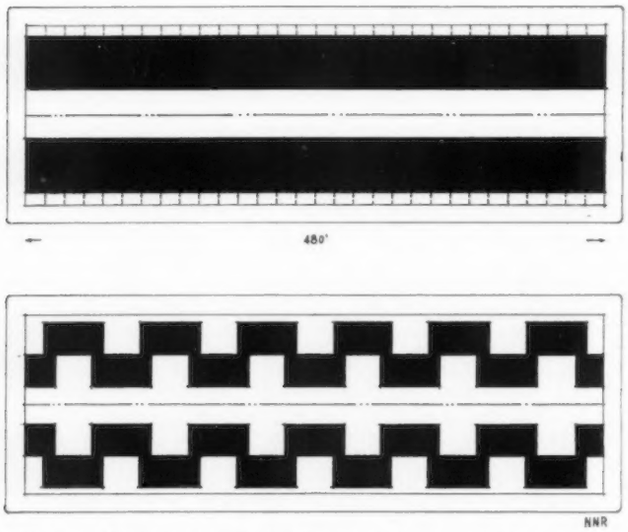
New and old views of apartment house (83 per cent rented) at 220 Sullivan Street, New York City, remodeled by Thomas Williams.

A LOW RENTAL APARTMENT GROUP

DESIGNED BY
NORMAN N. RICE

BUILDING COST OF $2,500 AN APARTMENT

The problem was the design of an apartment type for Philadelphia which would offer, along with low rentals, full apartment service, plus garage facilities, a degree of privacy similar to that of the single dwelling, and aeration and daylighting superior to those found in the usual low-cost apartment and row houses. The important factor of low rentals eliminated consideration of the usual apartment sites, owing to their high cost. Although the solution presents nothing that is startlingly new, it does present a newer combination of known factors in an attempt to improve on present local planning methods.



Above—Narrow front dwellings built in a solid row are defective in aeration, daylighting and room disposition.

Below—"Crankshaft" grouping of broad units assures three exposures. Courts, 27 by 29 feet, provide ample light and cross-ventilation.

Selection of Site

Philadelphia contains many undeveloped blocks laid out to fit the row houses characteristic of this city. These plots are multiples of the quite standardized 16' x 75' lot, fitted for the row house of six rooms, bath, and basement garage. These blocks, in general, measure 150 feet by approximately 500 feet. Such ground can be purchased for $35 to $100 per front foot depending on the neighborhood. As a rule, the blocks are close to trolley transportation. The selection of such low-cost sites obviates the necessity of multistoried buildings for successful promotion.

Construction

The most inexpensive type of construction permitted by the building code is for buildings classified as one- or two-family dwellings. Consequently, this apartment group was designed to come under the classification of two-family dwellings (one stair serving a maximum of two families).

This allowed the use of 9-inch exterior walls and wood frame floors. A saving was effected in the exterior brick walls by using the 8-inch "rolok-bak" hollow wall advocated by the Common Brick Manufacturers' Association. This wall uses 10½ brick per square foot as compared with 15 brick per square foot in the 8-inch solid wall. The material used here is hard common brick, the run of the kiln as to color, the brick up to the first floor line being selected black in color.

Party walls and foundation walls below grade are concrete blocks, 12 inches wide.

The floor and roof framing consists of 3" x 3" joists, 16 inches on center and bridged. The framing runs parallel to the stairs, the joists resting on

the front and rear walls and on an interior bearing partition. The spans are regulated to accommodate stock length joists of 12 feet and 16 feet. Studs in bearing partitions are 3″ x 4″; in nonbearing partitions, 2″ x 3″. The interior wall and ceiling finish is plaster on rock lath, painted or papered. All doors, windows and trim are stock items. The windows are metal weatherstripped casements with roll screens.

Roofs are flat, covered with three-ply built-up slag roofing. Between the roof and second floor ceiling is a 2′ 3″ ventilated air space.

Floors in the living rooms and bedrooms are ⅜″ strip hardwood flooring over an underfloor of 1″ x 6″ roofers and a layer of building paper. The kitchen floors are linoleum. Bathrooms have tile floors and wainscots, and standard quality fixtures. The kitchen and bathroom fixtures are grouped so that drainage and supply stacks are at a minimum. The kitchen equipment is the built-in apartment type of compact units. In addition, each kitchen contains a full size gas range and a fold-away dinette table and seats.

Standardized Planning

Standardization of the apartment plans effects an economy in quantity buying and in labor costs. Since, in Philadelphia, larger families prefer the single house type, the usual apartment tenants are small families. For this reason, an apartment plan consisting of four rooms (living room, kitchenette-dinette and two bedrooms), bath and garage (in basement), was selected, this being ample for a couple or for a family of two adults and one or two children. The broad front plan type was selected for its compact and economical room disposition, and for its superior aeration and daylighting.

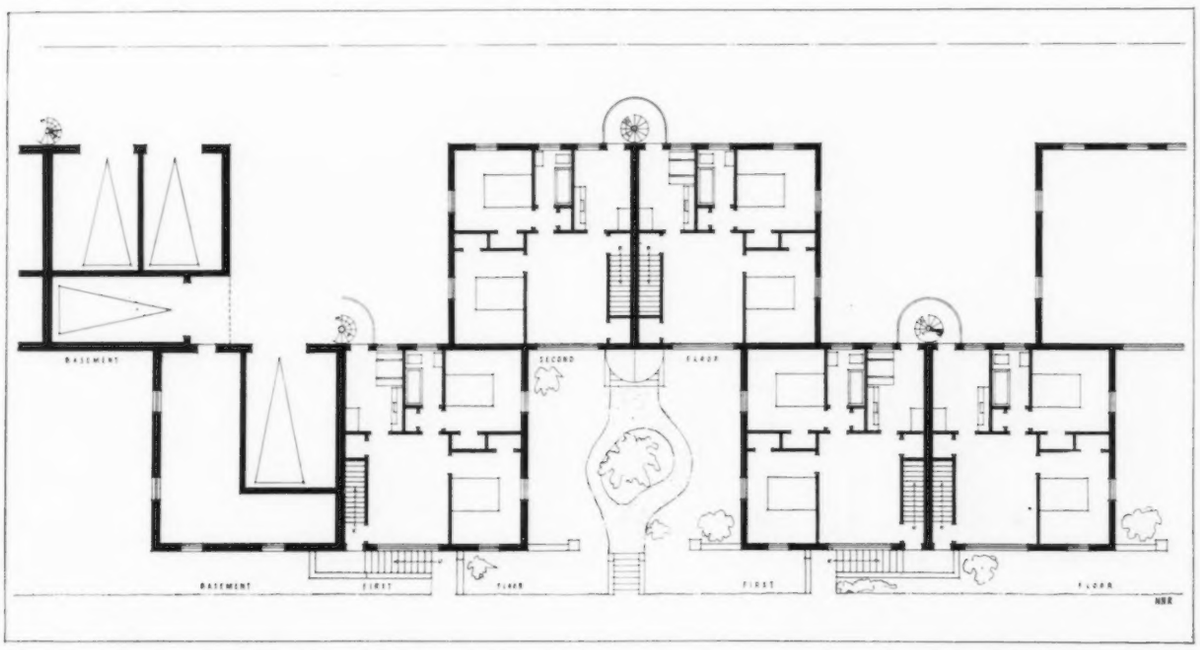
A two-family house on a 16-foot frontage utilizes 8 feet of frontage per family; in the "crankshaft" grouping, eight families utilize 80 feet of frontage, or 10 feet per family. Where ground is valued at $35 to $100 per front foot, this item of $70 to $200 is more than balanced by the superior aeration, daylighting and outlook.

The basement garages open on a paved driveway between the two rows of buildings. This driveway is excavated to 3 feet below the natural grade (same level as the basement), and ramped up to the streets at both ends. The excavated earth is used for terracing up the street fronts. Circulation between apartments and garages is by means of the circular steel service stairs at the rear. Each group of four apartments has laundry and storage facilities in the basement.

Building Costs

Although this development is planned as a group of two-family dwellings for reasons of building cost, it is intended to be operated as an apartment building. Heat and hot water will be furnished by a central plant. The owner will also provide janitor and gardener service.

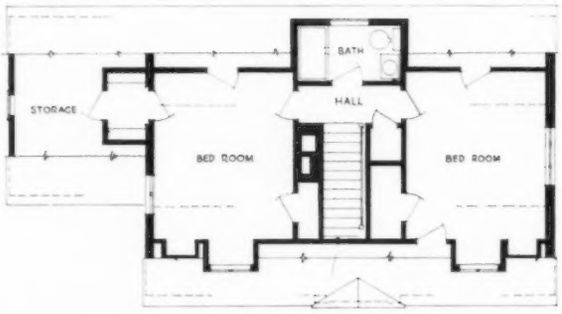
The actual building cost is $10,000 per unit of four apartments, or approximately 25 cents per cubic foot. The ground cost per unit (40 front feet, average) may vary from $1400 to $4000, depending on the site. On this basis, and on the estimated carrying charges and operating costs, rentals, including the garage, will vary from $45 to $65 per month.



Construction is similar to that of the usual Philadelphia row house, except for a few special features and the better quality demanded for an investment rather than a "quick-sale" promotion. Room plans are standardized. Street courts provide protected play space for children.

A 5-ROOM HOUSE FOR A COST OF $4,200

Pierce and Co.



SECOND FLOOR

FIRST FLOOR

House designed for Architects' Small House Service Bureau, New England Division.

By G. F. MARLOWE, Architect

In designing this house an attempt was made to take advantage of recently developed materials and methods of construction and to produce a house which could be built at a real, not merely a trivial, saving in cost, and which at the same time would be acceptable, attractive and practical for a family of three or more persons.

Since the Architects' Small House Service Bureau was established, with its first division in Minneapolis, most of the Bureau's efforts have been directed toward improving the small house plan and design with little change in methods of construction. In this case the approach has been somewhat different.

For a story-and-a-half house, the space is economically distributed by placing two rooms under the roof on the second floor, and by providing on the first floor a living room with dining alcove, kitchen and one bedroom, the latter being available for a dining room if desired. This arrangement permits economical use of masonry exterior walls.

Two alternative arrangements have been worked out—one for a cellarless house with heating by gas steam radiators, the other for the conventional type with cellar. Estimates upon these designs have been obtained from a conservative builder in the vicinity of Boston, specializing in smaller residential work. The estimates give a figure of $4,200 for the cellarless type complete with heating by gas steam radiators, with the exception of finish grad-

ing. The same design with cellar and warm air heating is figured at $4,500.

The cellarless house is designed to have linoleum floors laid over cork or other suitable insulating base on a concrete slab over gravel fill for the first story. The second floor is to be of the usual joist construction with wood finish and underfloors. Outside masonry walls are to be strapped. The exterior walls are 8-inch cinder concrete blocks of standard type, finished with two coats of waterproof cement paint. Steel sash of standard type is used for the windows. A good grade of asphalt shingles is to be used for the roof, although wood shingles would perhaps be desirable in localities where they are still permitted.

All plaster work is eliminated from the interior, plaster board or one of the standard types of insulating board being used for walls and ceilings. This is done to reduce the time otherwise required for plastering. Details have been worked out in such a way that few prominent joints are required; in most cases there are two widths of the material with a light chair-rail covering the junction. Interior finish is simplified as far as possible.

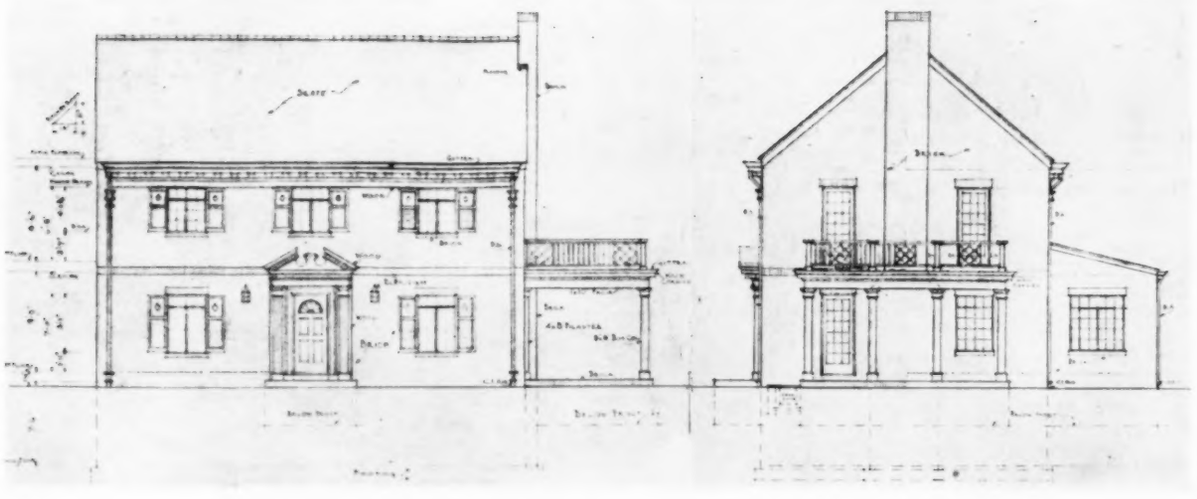
Costs Without Cellar

Excavation, cement work and mason work..	$795
Carpenter work	1,925
Steel sash and screens.....	178
Paint and paper.....	180
Electrical work	150
Linoleum	180
Plumbing	325
	$3,733
Heating—8 gas steam radiators.....	400
	$4,133

Costs With Cellar

General contract as above.....	$3,733
Cellar and wood floor.....	389
Hot air furnace.....	400
	$4,522

COMPARATIVE COSTS OF A 1-FAMILY HOUSE



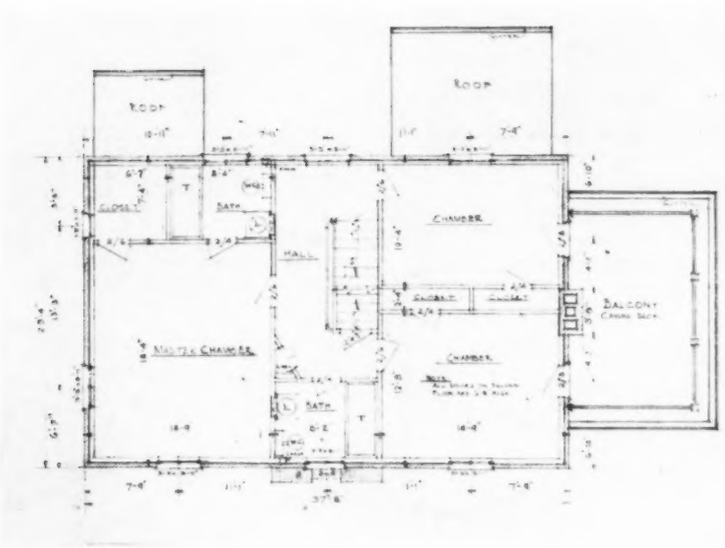
CUBIC CONTENTS — 36,000 CU. FT.

STEEL FRAME — BRICK VENEER	$17,895	PER CU. FT. 49.7c
STEEL FRAME — STUCCO.	$16,924	" " " 47.0c
WOOD FRAME — BRICK VENEER	$16,253	" " " 45.2c
WOOD FRAME — STUCCO	$15,503	" " " 43.1c

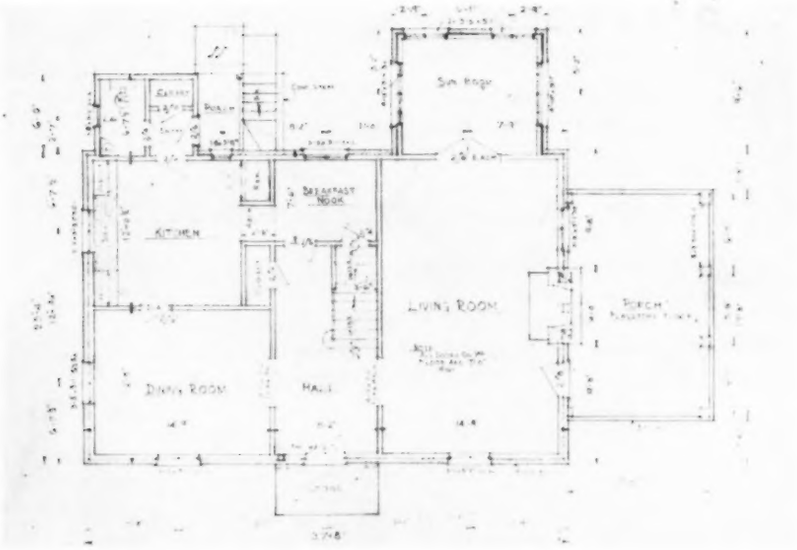
These estimates do not include finish grading or planting. They are based on construction costs (in quantity production) in Westchester County, New York. The steel framing consists of light angle sections; the exterior walls have a combination of insulating material and lath as a key for the brick veneer or as a base for the stucco. The house is designed by George G. Foster. Cost estimates are by Frank N. Goble, Inc., building contractors.

FLOOR PLANS OF A 1-FAMILY HOUSE

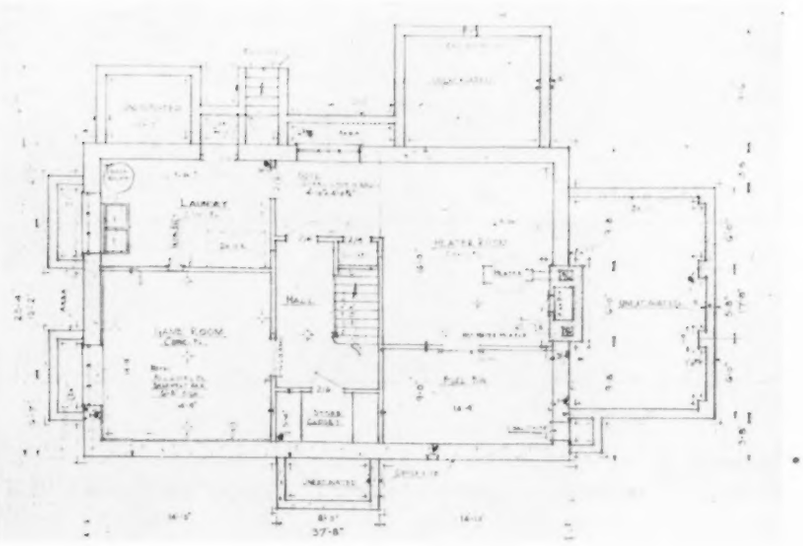
Designed by George G. Foster
Cost Estimates (on Page 443) by Frank N. Goble, Inc.



SECOND FLOOR



GROUND FLOOR



BASEMENT

The planning of almost every type of building involves some consideration of its relationship to the possible supply of sunlight. As the therapeutic value of the sun's rays becomes more generally recognized by the medical profession and the public this subject assumes greater importance for the architect. Where the climate is hot during a portion of the year the problem may be to exclude sunlight at that time as well as to admit it during the rest of the year. A sunlight analysis will usually be found essential in connection with such buildings as hospitals and schools, and frequently desirable in connection with dwellings.

A RAPID METHOD FOR DETERMINING SUNLIGHT ON BUILDINGS

By Howard T. Fisher

The object of this study is to furnish the necessary astronomical facts, together with directions for their use, in such a way that a sunlight analysis can be easily and quickly prepared by any person familiar with the casting of conventional architectural shades and shadows.

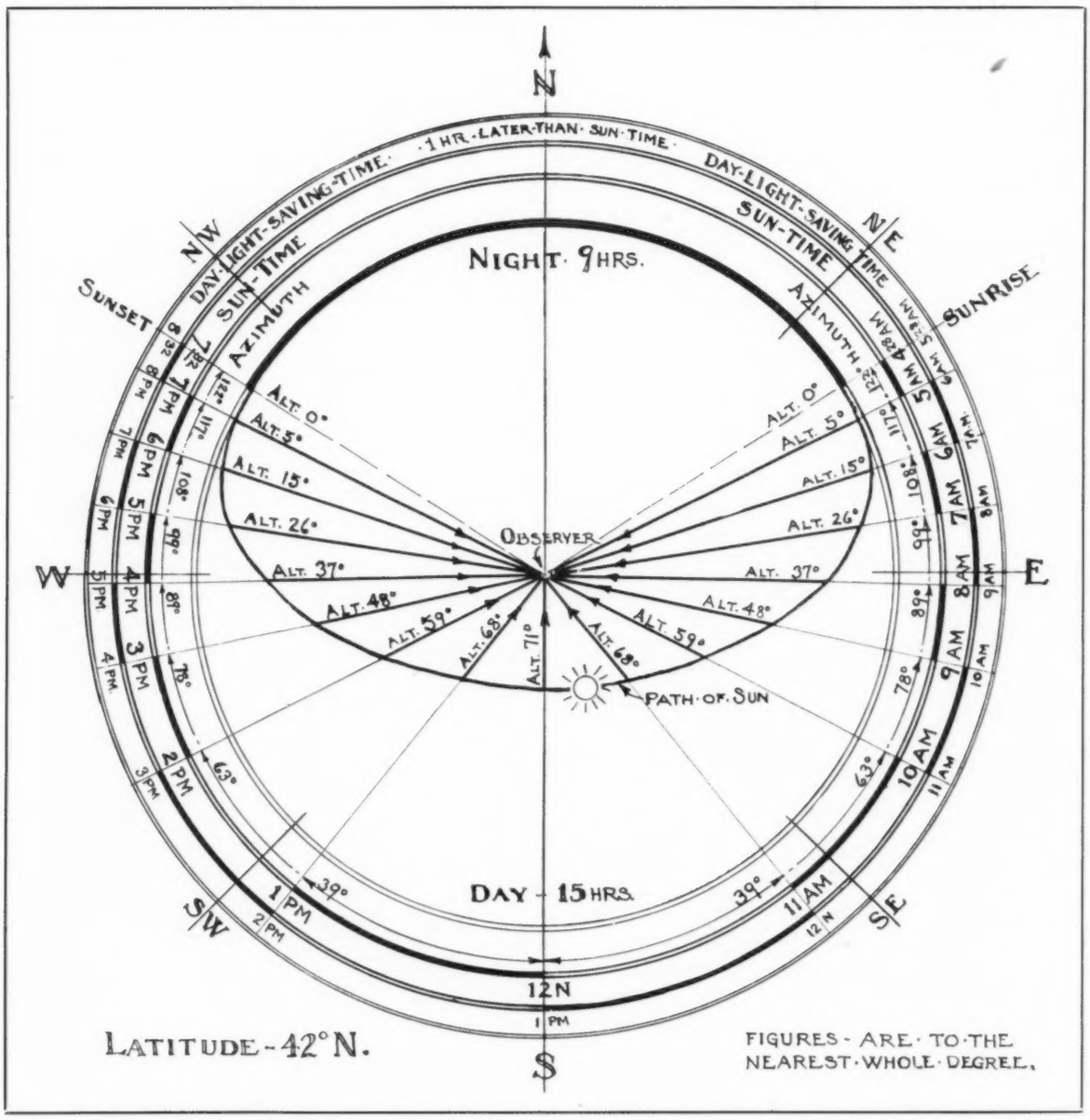
Once the angle of the ray of light from the sun has been determined in plan, elevation and section the problem of casting shadows for a specific day and hour is identical with that of casting conventional architectural shades and shadows, the only difference being that the given angles are used in place of the conventional 45° angles. (The use of several adjustable triangles which may be set for any given angle will prevent this fact from complicating the mechanics of drafting.)

From the sun charts the angle of the ray of light in plan, elevation and section may be rapidly determined for any even hour for the winter solstice, equinox and summer solstice for a latitude of 42° north. This latitude is approximately that of Boston, Cleveland, Chicago and Omaha, and for all ordinary purposes may be taken as typical of the northern portion of the United States. The winter solstice is the shortest day of the year and represents extreme winter conditions. Owing, however, to the very slow rate of change in the position of the sun at that time of year (see chart on page 452) conditions on that day may be taken as typical of the early winter months. For the same reason conditions at the summer solstice may be taken as typical of the early summer months. The rate of change in the position of the sun during the early spring and early fall is very rapid but the equinoxes fall in the middle of those periods and may be taken as typical of them.

For the purpose of showing the movements of the sun in relation to an observer it has been found best to consider the world as a flat circle, with the observer in the center, and the sky as a hemisphere or inverted bowl placed over the earth, and meeting it all around at the horizon. In the accompanying sun charts the earth and the celestial hemisphere are shown in plan as they would appear looking down from above. The path of the sun is shown on the surface of the hemisphere. Radiating lines show the position of the sun in relation to the observer at intervals of one hour. By means of the azimuth, or number of degrees the sun is east or west of the south point, and the altitude, or number of degrees the sun is above the horizon, the exact position of the sun is determined.

The time given on the charts is sun time which may differ from standard time by as much as half an hour. Where this difference is of importance sun time can easily be converted to standard time. Sun time and standard time are the same for the following longitudes west of Greenwich: 75°, 90°, 105°, 120°. For every degree east of these points sun time is 4 minutes later than standard time, and standard time is 4 minutes earlier than sun time. For every degree west of these points sun time is 4 minutes earlier than standard time and standard time is 4 minutes later than sun time.

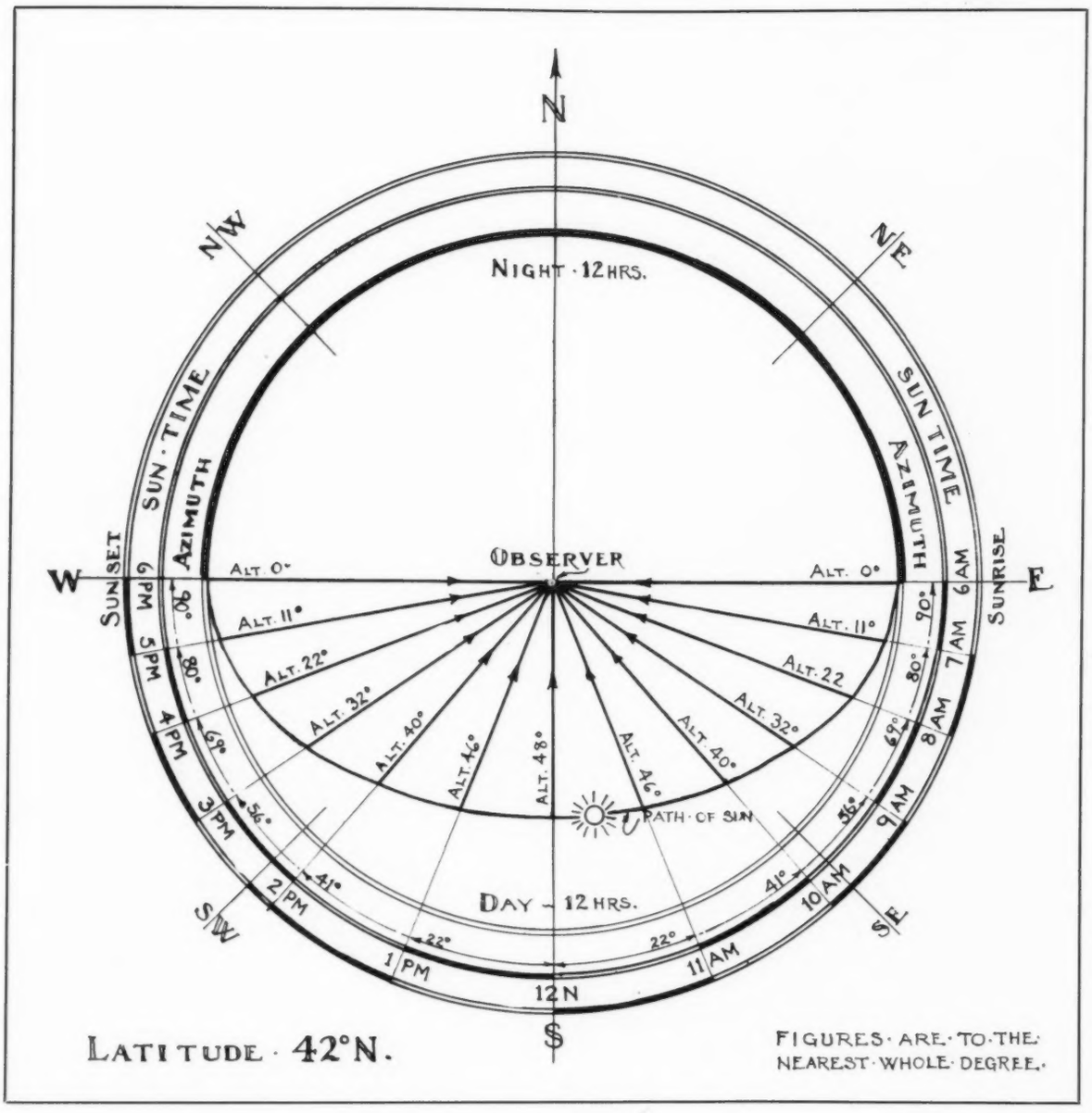
Where for any reason more accurate results are required than can be derived from the sun charts here given the architect may compute the exact position of the sun for any given time for any given location by the method described below. This process is similar to that by which the position of a ship is determined at sea. In the one case the position of the sun and the time of day is known and the location is desired; in the other case the location and the time of day is known and the position of the sun is desired.



SUMMER SOLSTICE
June 21 (approx.)
Longest Day of Year

The sun rises in a northeasterly direction and sets in a corresponding position in the northwest. It is not until a few minutes before 8 a.m. that the sun passes south of the east point and it is not until a few minutes past 4 p.m. that it passes north of the west point. The sun is visible above the horizon for 15 hours; of that time it will shine approximately 6½ hours on the north face and 8½ hours on the south face of a building placed due east and west.

The sun is nearly overhead at noon, being at an altitude of 71° above the horizon. During the hour each side of noon it passes through 39° of azimuth in contrast to the 9° to 11° passed through per hour earlier and later in the day. In a period of approximately only 2½ hours the sun passes all the way from the southeast to the southwest. As a result, at the summer solstice there is admitted by a south window, with 1-foot reveals, less than one-third the amount of sunlight that is admitted by a southeast or southwest window and less than one-sixth the amount that is admitted by an east or west window. Even a southeast or southwest window admits only about two-thirds the amount of sun that is admitted by a northeast or northwest window.*



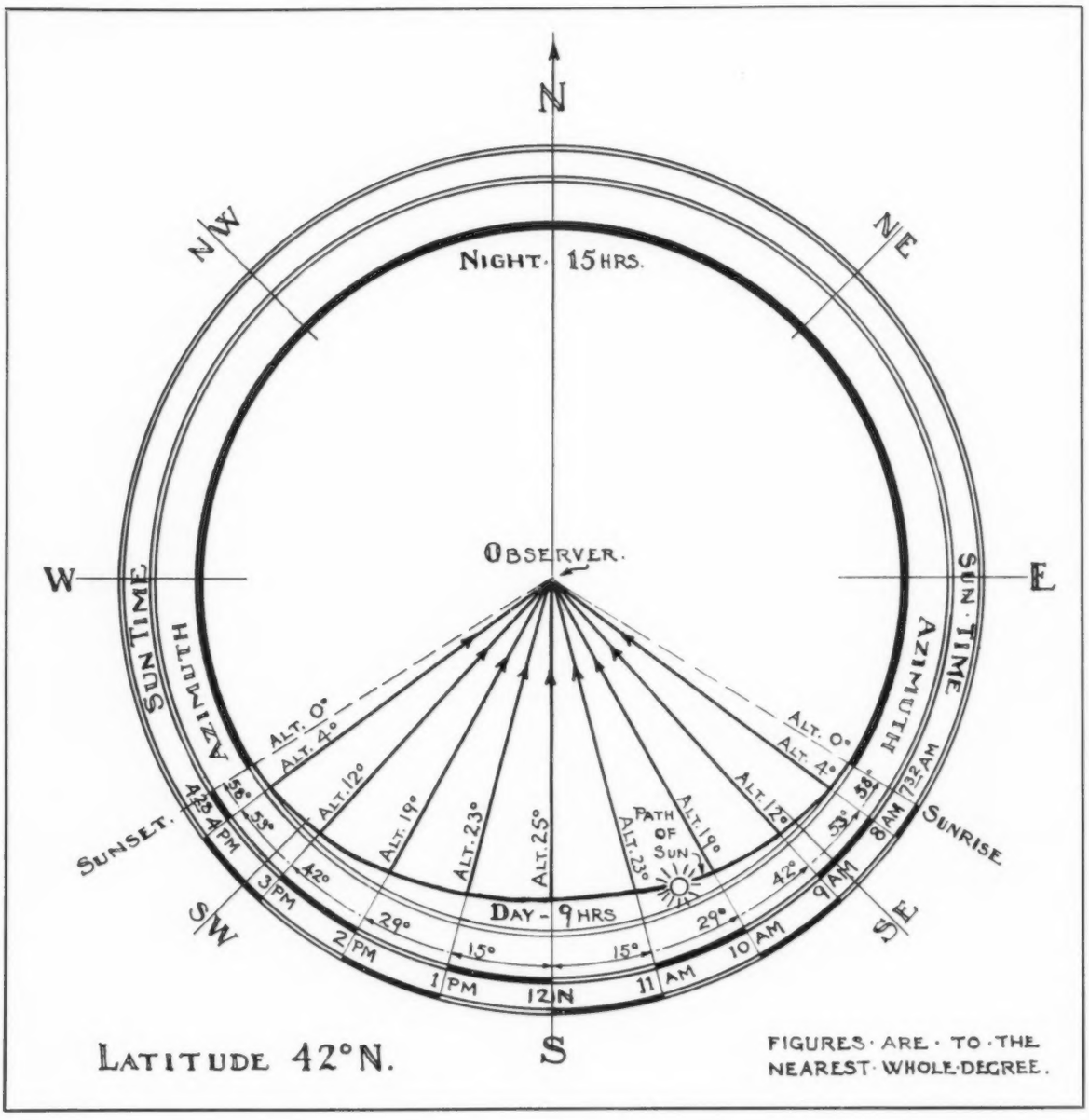
The sun rises in the exact east and sets in the exact west. At a few minutes before 10 a.m. the sun passes south of the southeast point and at a few minutes past 2 p.m. it passes north of the southwest point. The sun is visible above the horizon for 12 hours, all of which time it will shine on the south face of a building placed due east and west. (It will not shine at all on the north face.)

The sun is at an altitude of 48° above the horizon at noon. The difference in the number of degrees of azimuth passed through per hour at different times of day is very much less marked than at the summer solstice. At this time of year southeast and southwest windows admit most sun. East, west and south windows all admit about the same amount, or about three-quarters as much as a southeast or southwest window. Northeast or northwest windows admit only a small amount of early morning or late afternoon sun.*

SPRING EQUINOX
March 21 (approx.)

FALL EQUINOX
Sept. 21 (approx.)

* See THE ORIENTATION OF BUILDINGS OR PLANNING FOR SUNLIGHT by William Atkinson, John Wiley & Sons, New York, 1912.



WINTER SOLSTICE
December 21 (approx.)
Shortest Day of Year

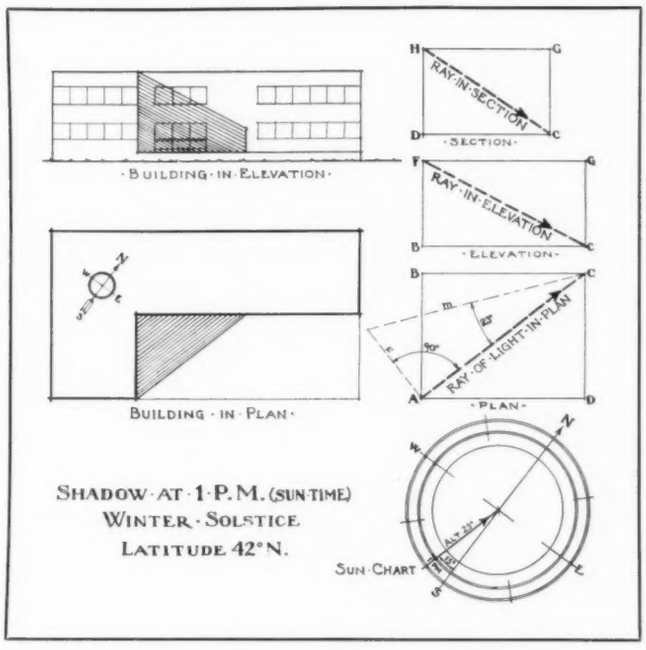
The sun rises in a southeasterly direction and sets in a corresponding direction to the southwest. At a little before 9 a.m. the sun passes south of the southeast point and at a little after 3 p.m. it passes north of the southwest point. The sun is visible above the horizon for only 9 hours. It will not shine at all on a north face of a building and will only shine for a little over an hour on a northeast face, just after rising, or on a northwest face, just before setting.

The sun is very low at noon, being at an altitude of only 25° above the horizon. Its rate of motion as measured by the number of degrees of azimuth passed through per hour differs but little throughout the day. At this time of year a south window admits by far the most sunlight, approximately half again as much as a southeast or southwest window, and more than 4½ times as much as an east or west window. No sunlight will be admitted by a northeast or northwest window because of the 1-foot reveals assumed.*

* See THE ORIENTATION OF BUILDINGS by William Atkinson.

METHOD OF USING SUN CHARTS

EXAMPLE: SHADOW IN PLAN AND ELEVATION



The Problem:

Assuming an L-shaped building with a given orientation located at a latitude of 42° north, find the shadow which will be cast by the projecting wing at 1 p.m. sun time at the winter solstice.

The Solution:

1. Cut out the winter solstice sun chart and place it on the drawing with its compass points to agree with the orientation of the building.

2. Draw the line AC any convenient length parallel with the 1 p.m. line on the sun chart. *This represents the direction of the ray of light in plan.*

3. Draw lines AB, BC, CD and DA parallel to the sides of the building in plan.*

4. Draw line *m* from point C (the end of line AC towards which the sun is shining) at an angle to line AC equal to the altitude of the sun at 1 p.m., namely 23°.

5. Draw line *n* from point A (the end of the line AC away from which the sun is shining) at right angles to line AC, intersecting the line *m*.

6. Draw line BC in elevation and line DC in section.

7. Draw lines BF and CG in elevation and DH and CG in section, vertical, and equal in length to line *n*.

8. Draw lines FG, parallel to BC, and HG parallel to DC.

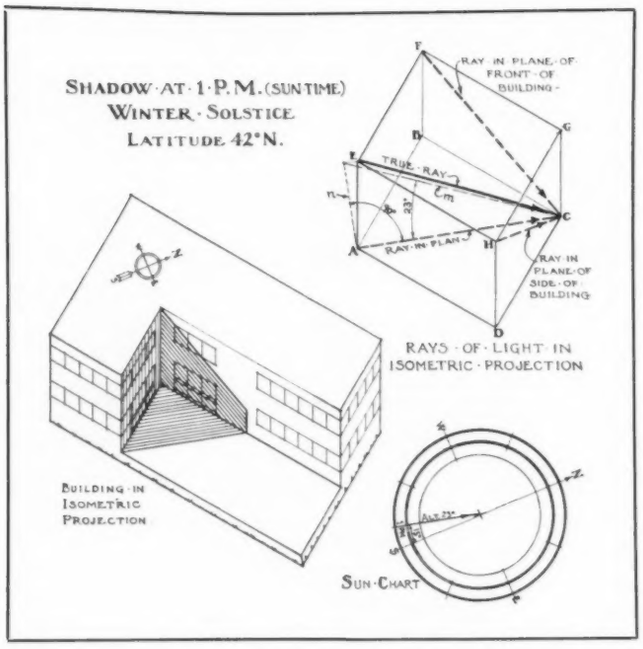
9. Draw line FC. *This represents the direction of the ray of light in elevation.*

10. Draw line HC. *This represents the direction of the ray of light in section.*

11. Knowing the direction of the ray of light in plan, elevation and section proceed to cast the desired shadows on the building by the same method used in casting conventional shades and shadows.

The above method may be employed regardless of the shape or orientation of the building, the hour of the day or the season of the year. Such problems as finding the sunlight admitted through windows or the shadows cast by one building on another can be computed with equal ease by the same method.

*Where the sides of the building are not at right angles to one another draw the lines parallel to and at right angles to the principal face of the building upon which the shadows will be cast.


SHADOW AT 1 P.M. (SUN TIME)
WINTER SOLSTICE
LATITUDE 42° N.
RAY IN PLANE OF FRONT OF BUILDING
TRUE RAY
RAY IN PLANE
RAY IN PLANE OF SIDE OF BUILDING
RAYS OF LIGHT IN ISOMETRIC PROJECTION
BUILDING IN ISOMETRIC PROJECTION
SUN CHART

EXAMPLE: SHADOW IN ISOMETRIC PROJECTION

The Problem:

Assuming an L-shaped building with a given orientation located at a latitude of 52° north, find the shadow which will be cast by the projecting wing at 1 p.m. sun time at the winter solstice.

The Solution:

1. Cut out the winter solstice sun chart and place it on the drawing with compass points to agree with the orientation of the building.

2. Draw the line AC any convenient length parallel with the 1 p.m. line on the sun chart. *This represents the direction of the ray of light in plan.*

3. Draw lines AB, BC, CD and DA parallel to the sides of the building in plan.*

4. Draw line *m* from point C (the end of line AC towards which the sun is shining) at an angle to line AC equal to the altitude of the sun at 1 p.m., namely 23°.

5. Draw line *n* from point A (the end of line AC away from which the sun is shining) at right angles to line AC, intersecting the line *m*.

6. Draw lines AE, BF, CG and DH vertical and equal in length to line *n*.

7. Draw line EF parallel to AB, FG, paralled to BC, GH parallel to CD, and EH parallel to AD.

8. Draw line EC. *This represents the direction of the true ray of light in isometric projection.*

9. Draw line FC. *This represents the direction of the ray of light in isometric projection in the plane of the front elevation of the building.*

10. Draw line HC. *This represents the direction of the ray of light in isometric projection in the plane of the side elevation of the building.*

11. Knowing the direction of the ray of light in isometric projection in plan and elevation proceed to cast the desired shadows on the building by the same method used in casting conventional architectural shades and shadows.

The above method may be employed regardless of the shape or orientation of the building, the hour of the day or the season of the year. (Any desired angles may be used in laying out the isometric drawing provided the plan is not distorted.)

The use of the isometric projection permits a clearer understanding of the results as the entire shadow is shown on one drawing. While apparently more complicated it is actually simpler to cast shadows on an isometric drawing as the true ray of light may be made use of in addition to the ray of light in plan and elevation.

*Where the sides of the building are not at right angles to one another draw the lines parallel to and at right angles to the principal face of the building upon which the shadows will be cast.

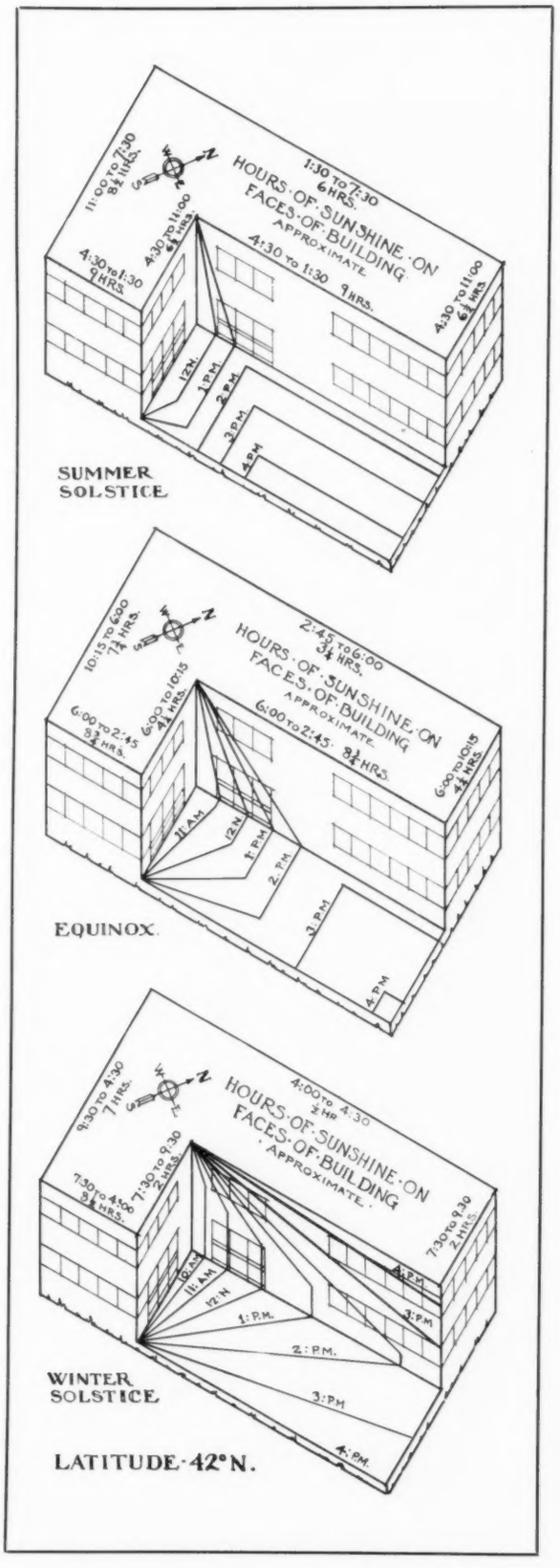
SUNLIGHT ANALYSIS

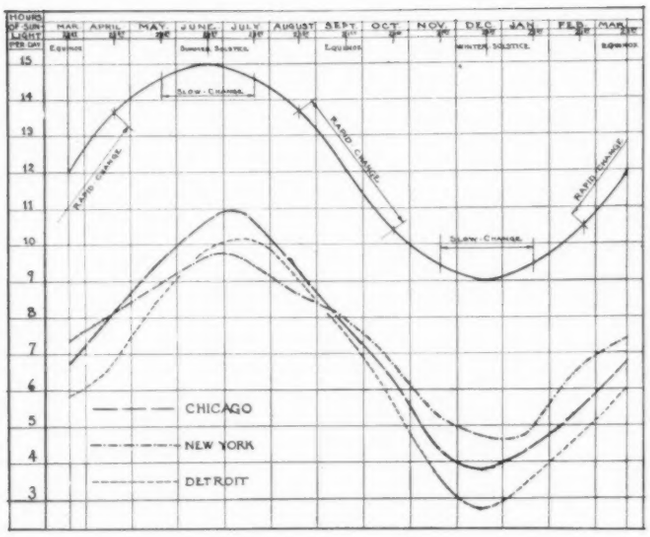
These diagrams show a typical sunlight analysis for the same L-shaped building assumed in the examples worked out above.

The upper diagram shows conditions at the summer solstice, approximately June 21, the longest day of the year. This may be considered as typical of the early summer months. All four faces of the building receive a good allowance of sunlight. The northwesterly face, with the least amount, receives two-thirds as much as the southeasterly faces, with the greatest amount. The southwesterly face with sun from 11 a.m. to the time of setting at 7:30 p.m. receives the bulk of the hot midday and afternoon sun. The projecting wing to the south casts only very little shadow on the main body of the building and only to the slightest extent cuts off the sun from the windows. The terrace is wholly in sunlight before 11 a.m. and wholly in shadow after 4:15 p.m.

The center diagram shows conditions at the spring and fall equinoxes, approximately March 21 and September 21. This may be considered as typical of the early spring and early fall months. The northerly faces of the building now receive only about one-half as much sun as the southerly faces. The southeasterly faces still receive the greatest amount of sun, and the southwesterly face still the bulk of the warm midday and afternoon sun. The projecting wing to the south now casts more of a shadow on the main body of the building. By 1 p.m. it has cut off most of the sun from the lower left window, but the windows to the right are not affected. The terrace is wholly in sunlight before 10:15 a.m. and wholly in shadow after about 4:15 p.m.

The lower diagram shows conditions at the winter solstice, approximately December 21, the shortest day of the year. This may be considered as typical of the early winter months. The northeasterly faces still receive 2 hours of early morning sun. The northwesterly face, however, only receives ½ hour of late afternoon sun. The southeasterly face of the projecting wing receives 8½ hours of sunlight and the southwesterly face 7 hours out of the total of 9 hours possible. The projecting wing to the south now casts extensive shadows on the main body of the building. By noon it has cut off practically all the sun from the lower left window. By 2 p.m. it has started to cut off the sun from the lower right window. By 3 p.m. the lower right and the upper left window are wholly in shadow. By 4 p.m. the upper right window is largely in shadow, but as the sun sets at 4:30 p.m. there is little loss of sunlight in this case. The terrace is wholly in sunlight before 9:30 a.m. and wholly in shadow after 4 p.m.

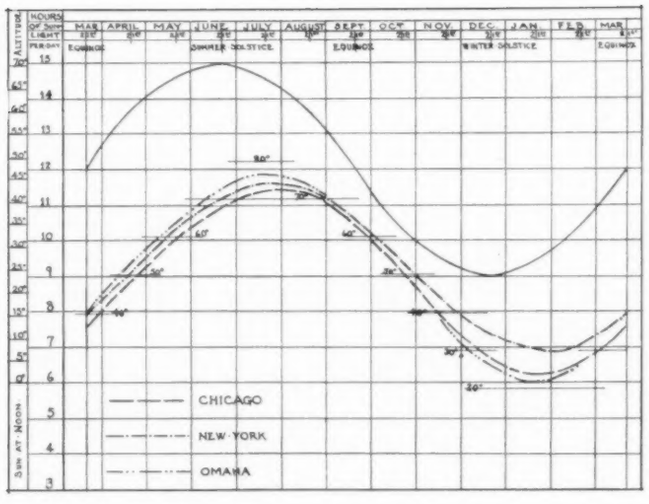




HOURS OF SUNLIGHT PER DAY

The upper continuous line shows the variation in the number of possible hours of sunlight per day throughout the year at a latitude of 42° north. From May 21 to July 21 the days are all nearly the same length varying only from approximately 14½ hours to 15 hours. The same condition exists from November 21 to January 21, the variation being only from 9 to approximately 9½ hours per day. During the early fall, from August 21 to October 21, and during the early spring, from February 21 to April 21, the rate of change is extremely rapid, the variation being from approximately 10⅓ to approximately 13⅔ hours per day.

The lower lines show for three cities the average number of hours of actual sunlight recorded by weather bureau observers during a period of years. Over the entire year only a little more than 50% of the total possible sunlight penetrates to the earth on account of clouds, fog, etc. In July Chicago receives 73% of the total possible sunlight, or an average of about 10¾ hours per day. New York, however, receives 64% in July, or an average of over an hour less per day than Chicago. In December New York receives 51% of the total possible sunlight, or an average of about 4¾ hours per day. Detroit, however, receives 29% in December, or an average of only a little over 2½ hours per day.



SUNLIGHT IN RELATION TO TEMPERATURE

The upper continuous line is the same as shown in the previous diagram. In addition, however, to showing the hours of sunlight, it also shows the variation in the altitude of the sun at noon throughout the year at a latitude of 42° north. The altitude varies by only 3° or 4° during the period from May 21 to July 21, yet varies by about 26° during a similar period from August 21 to October 21.

The lower lines show for three cities the average mean temperature. It is of interest that the high and low points of these curves occur about one month later than the high and low points of the sun curve above. In other words, in the localities for which these cities are typical, the hottest weather does not occur at the time when the sun is highest and the day longest, but about a month later. In the same way the coldest weather does not occur when the sun is lowest and the day is shortest, but about a month later.

METHOD OF FINDING POSITION OF SUN FOR ANY GIVEN TIME AND LOCATION

The following publications will be required:

The Summer Line of Position of Celestial Bodies, Hydrographic Office Publication Number 203. This may be procured from the Hydrographic Office of the United States Navy Department.

The American Nautical Almanac. This may be procured from the Superintendent of Documents, Government Printing Office.

The Problem:

Find the azimuth and altitude of the sun for New Orleans (latitude 30° N.) at 10 a.m. standard time on December 21.

The Solution:

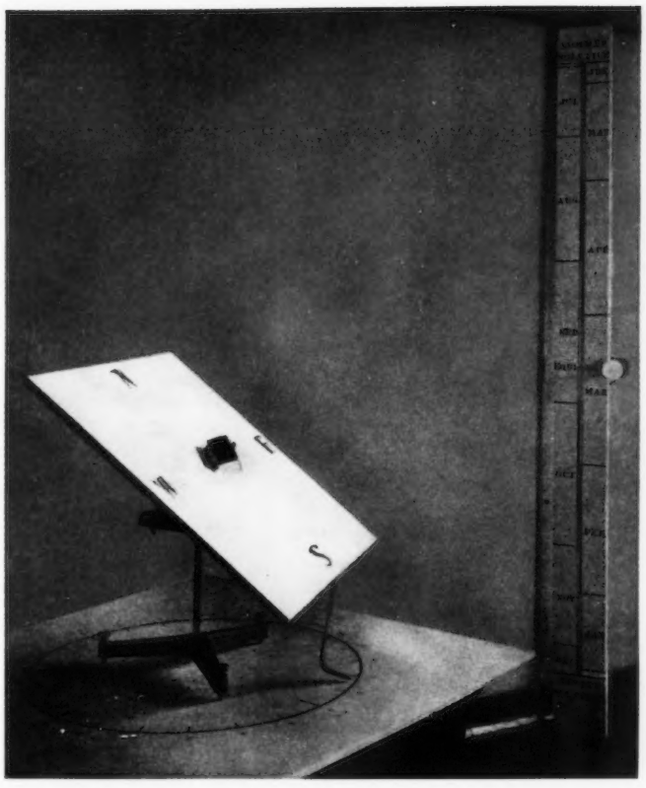
1. Convert standard time to sun time. As New Orleans is located on the 90th meridian, sun time and standard time are in this case the same.

2. In the *Nautical Almanac* find (on page 29 in the 1931 edition) the "Sun's Declination" for December 21. (As extreme accuracy is not required the variation from Greenwich Civil Time and the Equation of Time may be ignored.) Reading to the nearest whole degree the "Sun's Declination" equals minus 23°. The *minus* indicates that the declination is south; a *plus* would indicate that it was north. In this case the latitude of the place (New Orleans) is north and the "Declination of the Sun" is south, hence it is "Declination contrary name to Latitude." If they were both south or both north it would be "Declination same name as Latitude."

3. Compute the "Hour angle," or number of hours and minutes that 10 a.m. is away from noon. In this case the "Hour angle" equals 2 hours, 0 minutes.

4. In the *Summer Line of Position,* tables will be found (on pages 653 to 659) headed "Latitude 30°, Declination contrary name to Latitude." On page 658 under the subdivision headed *23°,* which is the "Sun's Declination," find in the first column the line containing the "Hour angle" of 1 hour, 57 minutes, 06 seconds—which is the nearest to the desired "Hour angle" of 2 hours, 0 minutes. The altitude of the sun, namely 30°—00° may then be read directly in the column at the edge of the page headed "True Altitude." The asimuth of the sun, namely 148.7° may be read in the second column to the right headed "Azimuth."

5. The azimuth as given in these tables is measured from the north point. If it is desired to measure it from the south point, as is done elsewhere in this article, all that is necessary is to subtract the azimuth taken from the tables from 180°. In this case 180° less 148.7° gives 31.3° or, figuring to the nearest whole degree, 31°. Since the time is before noon the azimuth of the sun is 31° east of south.



From The Journal of the Royal Institute of British Architects

SUN PLANNING WITH MODELS

The model is placed on a flat board so tilted as to make the required angle of latitude with a vertical axis of rotation. Movement of the board about this axis corresponds to change in time of day, the time for any position being indicated by a pointer upon a horizontal scale. A lamp, representing the sun, can be adjusted vertically to the correct declination for any date or for the average of any season of the year. By rotating the board the period of insolation for any part of the model can be read directly from the horizontal scale.

The instrument enables the durations of insolation of the walls of a proposed building at any season to be rapidly measured. The board with the attached model is rotated and the times at which the sun commences and ceases to shine upon the various walls are noted. Any obstructions can be simulated on the board by additional models, while a change of orientation merely entails a rotation of the model relative to the board. Many problems in town planning connected with the widths and directions of streets and with the heights of buildings can thus be solved with a minimum of labor.

The instrument was designed by A. F. Dufton and H. E. Beckett.

BOOK REVIEWS

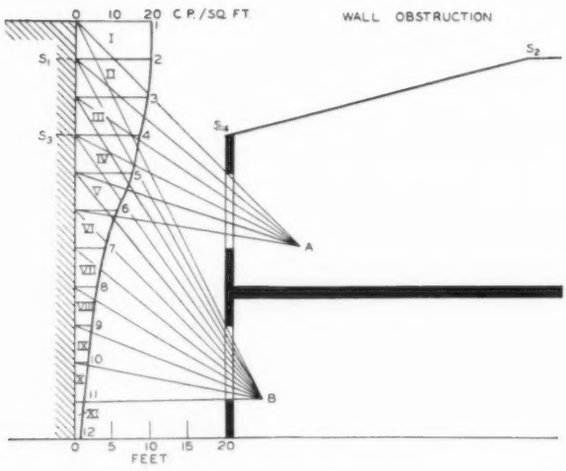
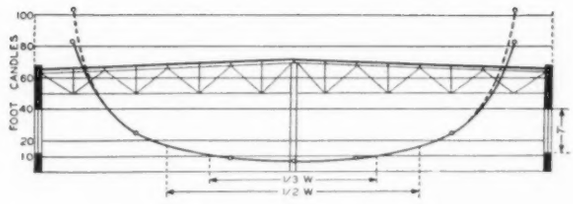
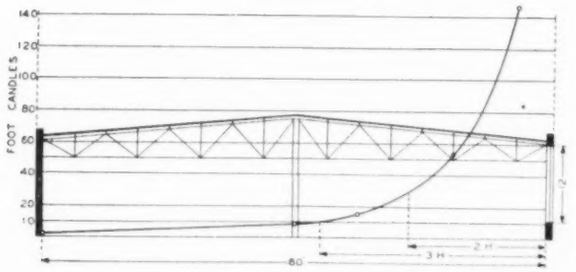


Illustration of use of protractor to determine light reflected from a surface.



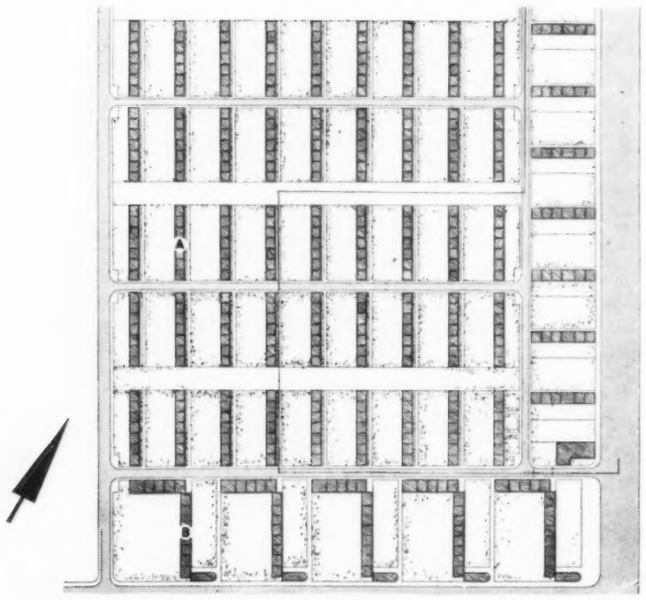
Distribution of daylight with continuous windows 7 feet high throughout two sidewalls.



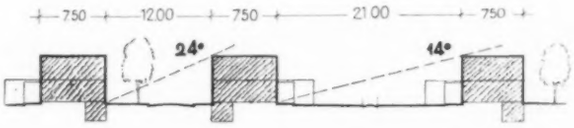
Distribution of daylight with continuous windows 12 feet high throughout one sidewall.

A RAPID METHOD FOR PREDICTING THE DISTRIBUTION OF DAYLIGHT IN BUILDINGS. By Waclaw Turner-Szymanowski. Engineering Research Bulletin, No. 17, January 1931. University of Michigan, Ann Arbor. 88 pp. Price, $1.

This bulletin presents a detailed account of the protractor method based on the analytic formula of Higbie and Levin for predicting daylight illumination of buildings. This formula was evolved to determine the probable illumination from rectangular surface sources at any angle with the working plane. The bulletin works out a simple mode of applying the formula and illustrates its application to eight different building types.



A working class community in Frankfurt. Good sunlight is insured for all living quarters.



A housing development in bank with buildings spaced to secure sunlight.

RATIONELLE BEBAUUNGSWEISEN. Published by the International Congress for Modern Architecture, 1931. Englert and Schlosser, Frankfurt-am-Main. 210 pp.

This book, well illustrated with plot plans and sectional diagrams, emphasizes the study of sunlight and proper orientation in housing. Examples of community developments in Europe and America are shown. Descriptive captions are in German, French and English.

MULTIPLE SERVICE AUTO STATION IN DETROIT

DESIGNED BY FIRESTONE REALTY COMPANY, AKRON, OHIO

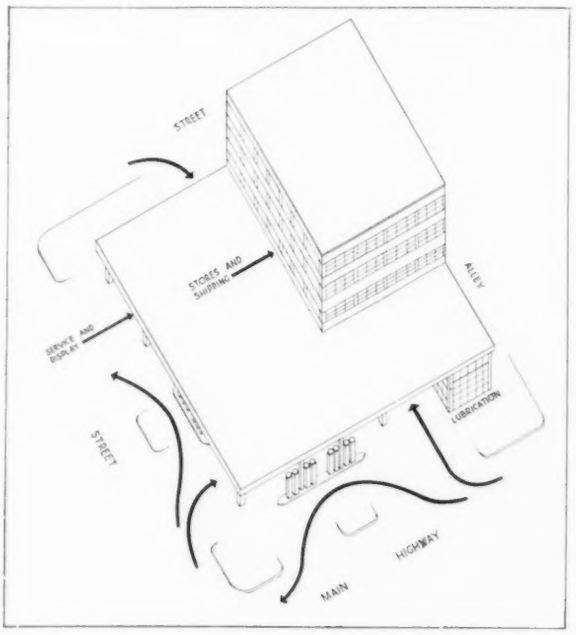
Sixteen different types of service — including brake testing, wheel alignment, battery work, high pressure lubrication, vulcanizing, car washing and polishing—are housed in this structure which covers one city block at the corner of one of the major motor highways in Detroit. The station is the largest unit in a chain of 450 one-stop service stations built during the last three years.

Capacity

Approximately 150 cars can be served at one time in all departments. The lubricating department can take care of 225 cars a day; the car washing department can handle 75 to 100 cars and the brake department 25 to 30 cars a day. A glass enclosed lounge is provided for the patrons.

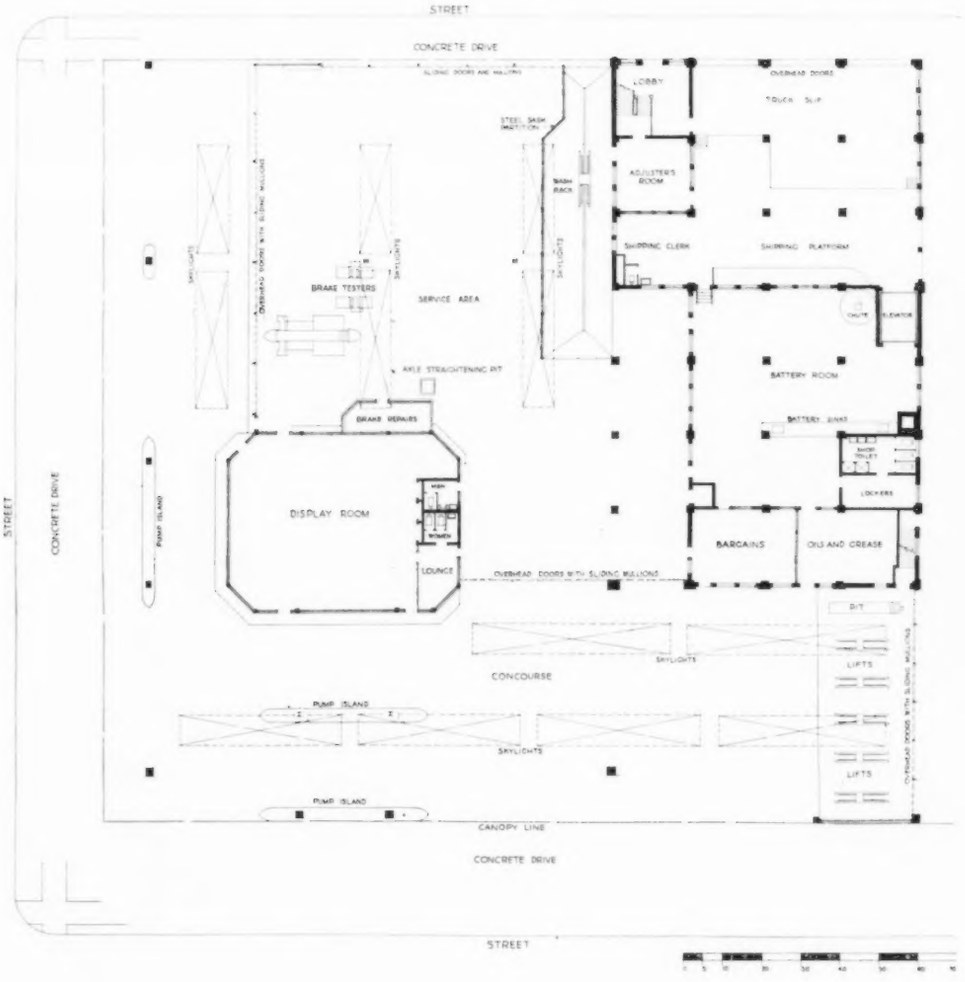
Construction

Reinforced concrete construction is used for the 4-story warehouse, and steel construction for the service station canopy. Vertical obstructions have been reduced to a minimum, and there are no visual or physical barriers between street and station. The wide column spacings permit easy access from the street to the concourse and service area. The sliding and overhead doors are constructed with sliding mullions. The skylights are movable and the lounge room glass enclosure can be opened in the summer.

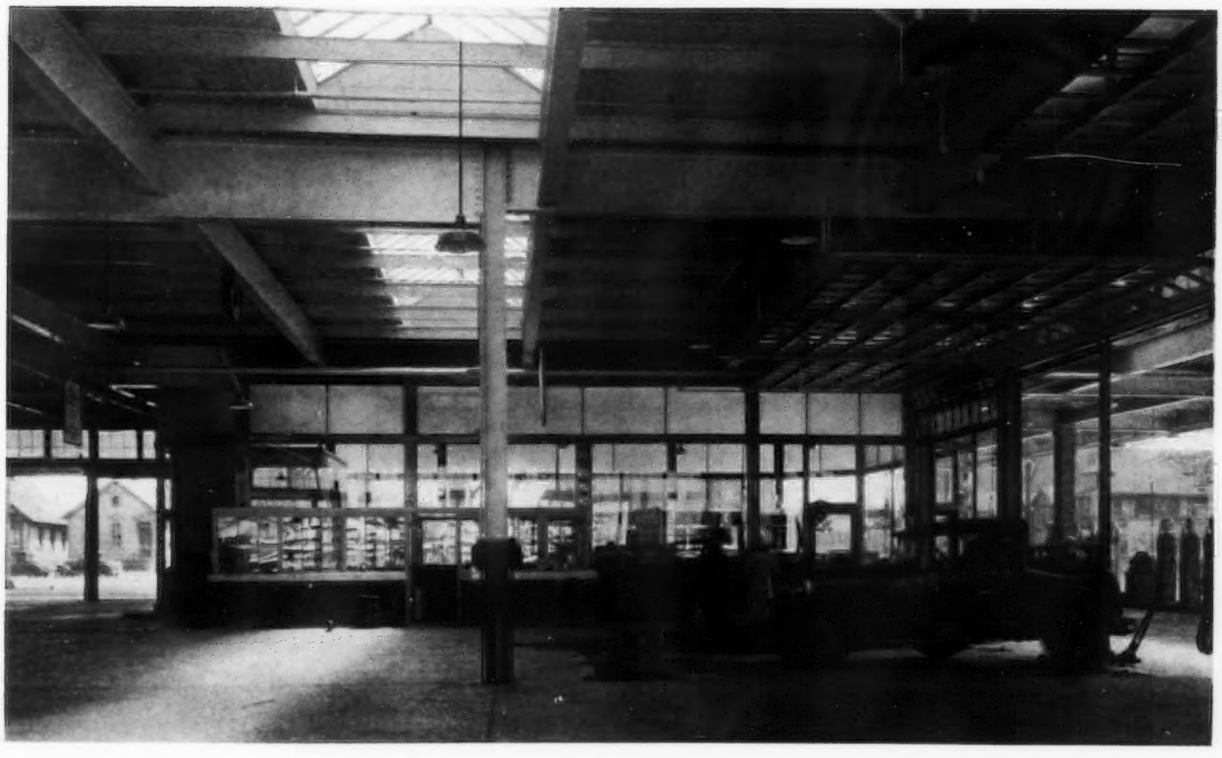


A DISTRICT OFFICE, WAREHOUSE AND ONE-STOP FILLING STATION IN DETROIT

Diagrammatic Arrangement of Services For a Capacity of Approximately 150 Cars



A DISTRICT OFFICE, WAREHOUSE AND FILLING STATION IN DETROIT
DESIGNED BY FIRESTONE REALTY COMPANY, AKRON, OHIO



A DISTRICT OFFICE, WAREHOUSE AND FILLING STATION IN DETROIT
DESIGNED BY FIRESTONE REALTY COMPANY, AKRON, OHIO

G. S. Lance

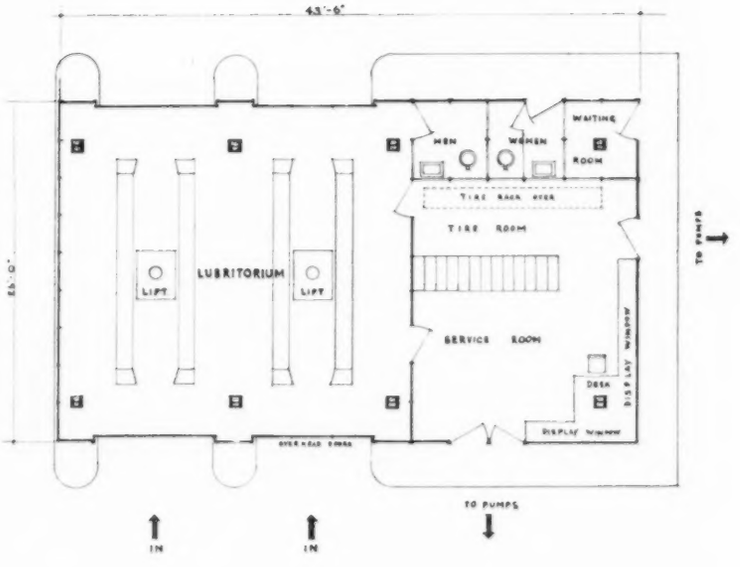
A STANDARDIZED FILLING STATION UNIT

This filling station, erected in Cleveland, is the first unit in a chain. Between 100 to 200 similar units are to be constructed each year, it is planned.

The construction cost of this station was $6,500, without equipment—a saving of approximately $2,300 below the estimated cost.

The concrete columns have been set back from the façades in order to allow a lightweight continuous glass wall which will conform to fire code restrictions. The walls are constructed of enameled metal plates backed with insulation.

Color scheme: red letters on a white background; red cornice; blue base and blue kickplates; metal strips painted aluminum.



DESIGNED BY CLAUSS AND DAUB, ARCHITECTS

ALUMINUM IN ARCHITECTURE

By HAROLD W. VADER
Holabird and Root, Architects

Hedrick-Blessing

RESEARCH AND ENGINEERING BUILDING, A. O. SMITH CORPORATION, MILWAUKEE
HOLABIRD AND ROOT, ARCHITECTS

Aluminum, as one of the new metals and alloys which can be easily formed into many shapes and patterns and which eliminate many maintenance items from the consideration of costs, has these characteristics to recommend its use in architecture:

1. Availability in quantity and in all forms known to metal working.
2. Uniform physical and chemical properties.
3. Lightness (aluminum and aluminum alloys weigh only one-third as much as the other metals commonly employed in architecture).
4. Workability.
5. Comparative low cost as a raw material.
6. Reasonable freedom from attack by the elements.
7. Strength (wrought aluminum alloys can be obtained with tensile strengths as high as 60,000 pounds per square inch).
8. Ease of joinery by welding and by means of screw-machine-products fabricated from the same material, thus eliminating the possibility of galvanic action.
9. Finish in varying shades of gray and with different surface textures.
10. Plating or coloring.

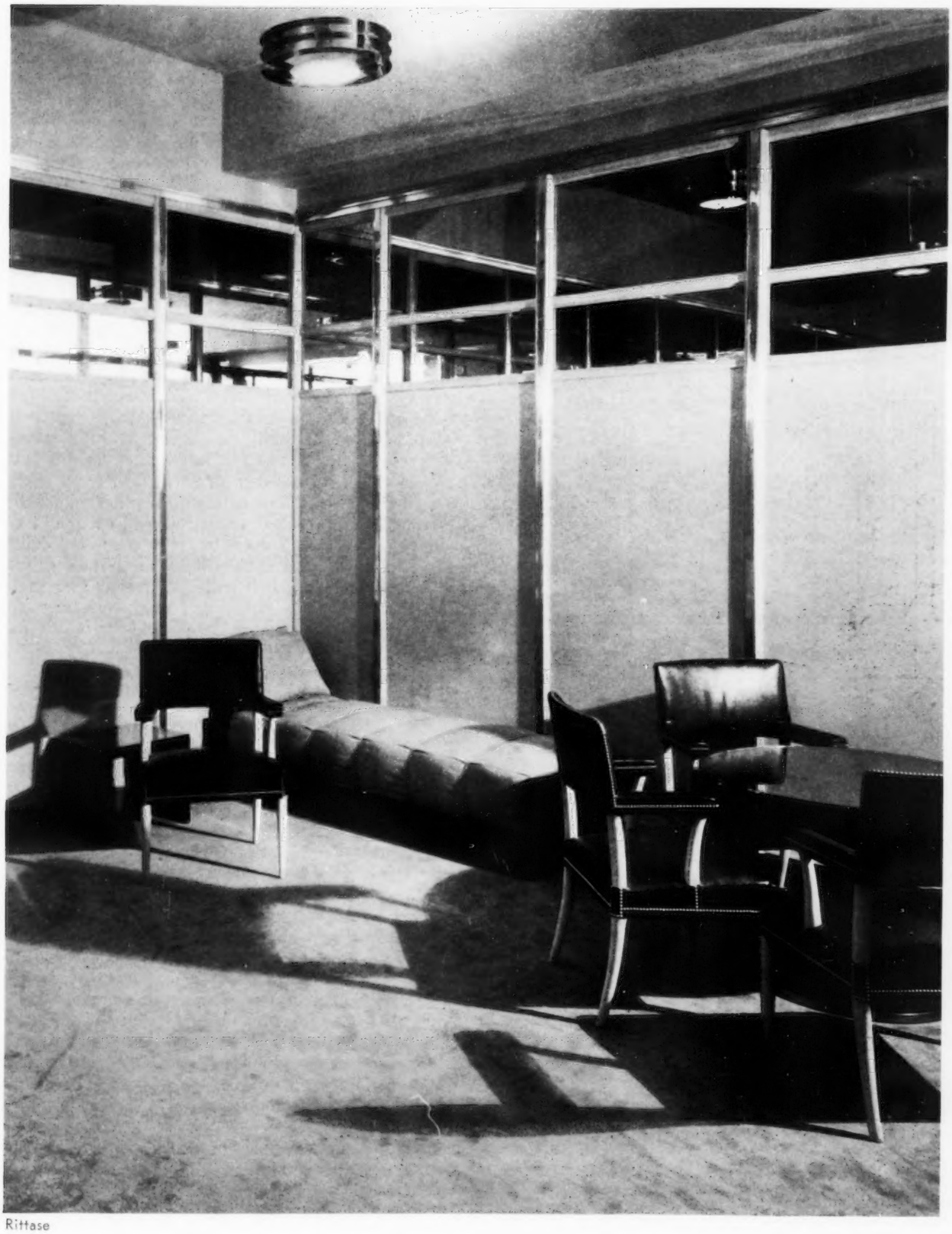
Approach to an All-Metal Façade

With the development of a structural-steel skeleton frame in the early eighties, the strains on the masonry walls of a building were relieved. Naturally, this made for taller buildings and permitted the use of materials other than masonry in the construction of the walls. Since the walls no longer served as a means of support, thinner walls could be employed and the load on the steel frame reduced. However, a material reduction in the thickness of a masonry wall, unless properly insulated and waterproofed, provided a means for moisture penetration. As a result, except for a few experiments with cast iron, masonry walls, 12 to 13 inches thick, have continued in vogue up to the present time.

Today a change in this type of wall construction seems logical from a purely economic standpoint. The skyscraper came into being in order to

Rittase

MAIN LOBBY
RESEARCH AND ENGINEERING BUILDING, A. O. SMITH CORPORATION, MILWAUKEE
HOLABIRD AND ROOT, ARCHITECTS



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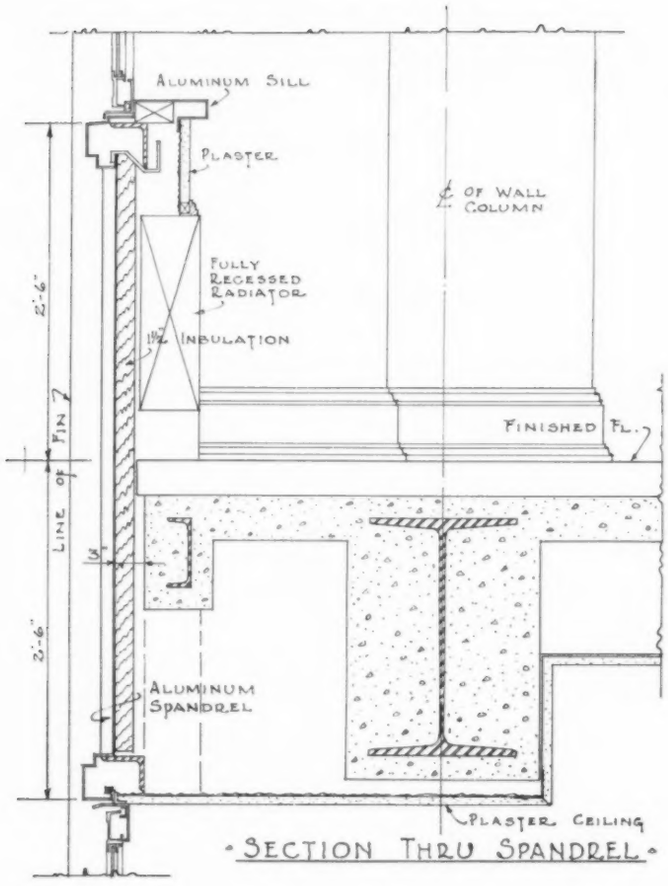
LOUNGE ROOM
RESEARCH AND ENGINEERING BUILDING, A. O. SMITH CORPORATION, MILWAUKEE
HOLABIRD AND ROOT, ARCHITECTS



TYPICAL ALUMINUM CONSTRUCTION DETAILS

make a more profitable use of land. By the use of metal façades it is possible to reduce the thickness of the walls 8 to 10 inches. This saving in wall area can be converted into rentable space. With the load on the structural-steel frame reduced by the use of metal in place of masonry, a material saving can be effected in the supporting structure. Again, a metal façade can be erected in approximately one-fifth the time required to erect a masonry wall. This results in economies particularly beneficial to the owner. Not only are erection costs reduced but the owner is able to capitalize on his investment in much shorter time.

In the construction of a metal wall either extruded shapes or plates may be used for the outer wall. If the inner wall is to assimilate metal, like materials can be used; however, if a plaster finish is desired, it is generally applied on expanded metal lath or plaster board. This type of metal wall, when the space between the two faces is filled with suitable insulating material, will have an insulating value considerably higher than a masonry wall.

One test recently conducted showed that a 3½-inch wall (aluminum, mineral wool, expanded metal lath, plaster) had the equivalent insulating value of a 32-inch masonry wall; while in October, 1929, a Technical News and Research article in THE ARCHITECTURAL RECORD pointed out that a double metal wall with 2 inches of insulation between the two faces had a heat loss of 0.125 B. t. u. as opposed to 0.623 B. t. u. for a 13-inch brick wall with one-half inch of plaster applied on the inner surface. The metal wall not only has a better insulating value but is a great deal lighter. A 2- to 5-inch, double-faced, metal wall suitably insulated will weigh under 25 pounds per square foot while the average 13-inch masonry wall weighs approximately 150 pounds per square foot.

Construction Features of the A. O. Smith Corporation Building

The Research and Engineering Building of the A. O. Smith Corporation in Milwaukee, by Holabird and Root, Architects, exemplifies the present trend by the extensive use of aluminum and glass.

The building is U-shape in arrangement. It has a height of 115 feet and a width of 170 feet; each of the two 45-foot wings is 205 feet in length. The base and entrance are of precast black granite synthetic stone, while limestone piers at the corners form abutments for the saw-tooth type of construction found in the metal and glass sections of the front and side elevations.

The V-bay windows formed of extruded aluminum frames and spandrels, the concave extruded pilaster sections of the same material and the buffed aluminum sheet metal cornice illustrate a practical application and use of metal for exterior building façades. The use of extruded aluminum was a procedure to insure greater accuracy, speed and economy.

Although the design and construction of the façade was revolutionary in a great many respects, only six days were required to close in the first of the two identical side elevations. Three days were required to close in the second and it is not too optimistic to assume that a similar building could now be inclosed in ten days. If masonry walls had been utilized, at least fifty days would have elapsed before the elevations could have been completed.

THE PRESIDENT'S CONFERENCE ON HOME BUILDING and HOME OWNERSHIP

By MICHAEL A. MIKKELSEN

The most numerous income group is that with annual incomes of $1,800 to $2,500. Families with incomes within this range generally pay from $35 to $50 a month in rent for apartments or dwellings and can afford to buy homes valued at $3,000 to $5,000. Is it possible for private commercial enterprise to build dwellings with modern sanitary equipment and sell the house and lot at a profit within this range of prices?

Stating the housing problem in this way, it is clear that every element of cost must be considered if an affirmative answer is sought. The main purpose—not, of course, the only purpose—of the conference is to report on all of the factors that enter into the selling price of low-cost dwellings. The present article comments briefly upon those factors, bearing principally upon the cost of sites, over which operative builders have no control and which can be influenced only by legislation or by planned cooperation in each local community.

The trends in residential construction observed in recent years suggest a number of questions important both from an economic and from a social point of view. The housing shortage that existed in 1920 had been overcome by the end of 1925, after four years of continually increasing production of moderate-cost one-family and two-family dwellings and of moderate-cost apartment buildings. After 1925 there was a decline in the volume of new low-cost private houses produced but for several years an increase in production of private houses of the more expensive grades. There was also, from 1925 to 1928 inclusive, a boom in apartment building, in consequence of which more new housing units were produced during this period in the form of apartment suites than in the form of new one-family and two-family houses. Since 1928 all speculative housing activities (apartment building and small-house developments) have suffered drastic declines.

According to the Monthly Labor Review for April, 1931, the percentage of families provided for in new one-family and two-family dwellings in 257 identical cities was 75.6 in 1921, 63.6 in 1925, and 57.8 in 1930, whereas the percentage provided for in apartment houses rose from 24.4 in 1921 to 36.4 in 1925 and 42.2 in 1930. These figures are for dwellings and apartments regardless of cost, but low-cost construction is so large an element in the figures that the inference of a relative decline in low-cost private dwellings is inescapable.

Does the relative decline in private house construction denote a permanent readjustment or merely a recurring phase of the business cycle in building? Is it due mainly to decreased population growth rate, coupled with a redistribution of age groups within the population? For example, there were fewer children under five years of age in 1930 than in 1920. Or is the decline due primarily to conditions that can be modified by legislative action with respect to credit facilities, taxation, building codes, zoning, street improvements, special assessments and the like?

Because the production of low-cost housing constitutes so large a part of the total of residential construction, and because this production has social as well as economic bearings, the proceedings of the President's Conference on Home Building and Home Ownership, which meets in Washington, December 2 to 5, are sure to command wide attention. Summary reports by the chairmen of thirty-one committees, with a total membership of about 400, will be read into the minutes. These reports, together with appendices in the form of technical studies illustrated with statistical tables, plans and designs will no doubt be published later in a series of volumes. The conference was organized about a year ago under the chairmanship of Secretary Lamont of the Department of Commerce and Secretary Wilbur of the Department of the Interior. The executive secretary is Dr. John M. Gries. Funds to cover its activities have been obtained from private sources.

Problems Before the Conference

The purpose and scope of the conference were set forth on September 15 in a statement by President Hoover, from which the following paragraphs are taken:

"The conference . . . will deal with the whole question of home construction and ownership and of the home environment. It will embrace finance, design, equipment, city planning, household management and many other aspects.

"Twenty-five committees, headed by men and women of authority and experience in various phases of the question have been engaged for months in gathering and analyzing available information and in making additional studies and inquiries. Their work is being correlated"—by six

additional committees—"so that on the basis of the facts a collective judgment may be formulated upon the best contemporary experience of leaders who have special knowledge of the subjects. It, obviously, is not our purpose to set up the Federal Government in the building of houses. But the conference will, I believe, afford a basis for the development of a sound policy and inspire better voluntary organization to cope with the problem. . . .

"The question touches many phases of both public and private activity. One of the important questions is finance. The present depression has given emphasis to the fact that the credit system in home building is not as satisfactorily organized as other branches of credit. Commerce, industry, and to a large extent farm mortgages, all have more effective financial reservoirs. In order to enable the purchase of homes on what amounts to the installment plan, it is necessary to place first and, often enough, second mortgages. . . . In the period of expansion preceding the current depression, rates for second mortgages, including commissions, discounts and other charges, rose in many cities to the equivalent of 20 or 25 per cent per annum. This not only stifled home ownership, but led to the loss of many homes through foreclosure."

The committee reports are not available as this issue of THE ARCHITECTURAL RECORD is being made ready for publication. However, it is clear from the President's statement that constructive recommendations may be expected from the Committee on Finance. Other committees whose findings are likely to be of special importance are those dealing with the development of unimproved areas (city planning and zoning, subdivision layout, and the like), rehabilitation of antiquated districts, and taxation.

The general property tax, it is claimed, places an undue share of the cost of local government upon real estate.

The Deadlock in Slum Clearance

How to remove the obstacles which stand in the way of rebuilding obsolete tenement districts with low-cost apartments is perhaps the most difficult problem before the conference. These obstacles are:

1. The risk of failure by the customary methods of the speculative building business. Architects have shown time and again that it is possible through economies of modern design and large-scale construction to rebuild a city block in a tenement district with low-cost apartments if the block can be bought at the prevailing market value. However, there are usually a score or more of property owners in a block and some of them are almost certain to refuse to sell at prices acceptable to the rest. Besides, the larger the unit of production, the less it lends itself to the purpose of the speculative builder who has to find a buyer for his product. One of the reasons for the rapid growth of suburbs and the perpetuation of city slums is the fact that speculative builders have had no incentive to rebuild old residential districts with improved housing for the class of people who occupy such districts, but find it safer and more profitable to build on new land.

2. The law of condemnation and the practices that have grown up in connection with it make the cost of acquiring land by municipalities excessive.

3. State constitutions prevent private property from being taken for other than public use. However, "public" use does not include the provision of housing by municipalities.

The older tenement districts have important advantages. They are centrally situated, within walking distance of the shops, offices and lofts where most of their residents are employed. They have a full complement of street improvements, with excellent police and fire protection, and are within reach of free clinics, and the like. It is a waste to extend city improvements and services, including rapid transit, into the suburbs on a scale larger than is necessary to permit of a wholesome reduction in density of the city population. It would be a gain from any point of view if the older tenement districts could be replanned to meet the altered economic needs and social standards of the city and if part of the districts could be rebuilt with low-cost apartments.

Newark, N. J., Tries New Solution

The State of New York undertakes to promote some degree of rehabilitation by tax exemptions (see Report of the New York State Board of Housing, Albany, reviewed in THE ARCHITECTURAL RECORD, p. 305, October, 1931). But a more novel experiment, suggested by Lawrence Veiller, secretary of the National Housing Association, is being tried in Newark, N. J. His scheme is described in the June, 1931, issue of *Housing* as follows:

"The plan in essence is that the local authorities and private enterprise—the latter in the form of what is known in England as public utility societies—should go into partnership in the effort for slum clearance. After having secured a state act empowering the local authorities to proceed to clear slums as an exercise of the police power of the state and as something in the public interest, to couple with this power the right to sell to private individuals or corporations a portion of the land thus acquired and cleared, the portion sold to be used solely for the building of houses for rehousing the population under conditions and restrictions to be laid down by the local authorities.

"The scheme contemplates that acting under such authority, the local authorities would clear the site (e.g., of a specific block in a slum district), acquiring the entire property either by expropriation proceedings, the methods of which are very strictly laid down under the Constitution and the laws, or at private sale, or by either or both of these methods. Having acquired the property, which can

(*Continued on page 66, Advertising Section*)

THE NEW JERSEY BELL TELEPHONE COMPANY'S *building at Newark. The architects — Voorhees, Gmelin & Walker—specified Barreled Sunlight for interiors of this handsome building.*

Interiors *of the* New Jersey Bell Telephone Building

are painted for lasting beauty and cleanliness

BARRELED SUNLIGHT is now available in two forms, Interior and Outside. Write for complete information on Outside Barreled Sunlight—its more pronounced whiteness, richer lustre and marked durability. (Note that both forms of Barreled Sunlight are readily tinted any desired shade.)

PAINTED surfaces in the recently completed building of the New Jersey Bell Telephone Company at Newark, N. J., are distinguished by a finish of flawless smoothness, rich lustre and pronounced depth.

In this handsome structure, as in many others of comparable distinction, Barreled Sunlight was specified for interior painting.

The growing preference for Barreled Sunlight is readily explained by its combination of good looks and sturdy wearing qualities, characteristics essential to satisfactory service in the modern building.

Its smooth, non-porous surface contributes to adequate light reflection. It is stubbornly dirt-resistant. It washes like tile, without wearing away.

Soft tints in any desired shade are readily secured by blending colors in oil with Barreled Sunlight white.

Our complete catalogue is in Sweets, but for your own files we would like to send you our booklet, "For Interiors of Lasting Beauty and Cleanliness."

. . .

Write U. S. Gutta Percha Paint Co., 22 L Dudley Street, Providence, R. I. Branches or distributors in all principal cities. (For Pacific Coast, W. P. Fuller & Co.)

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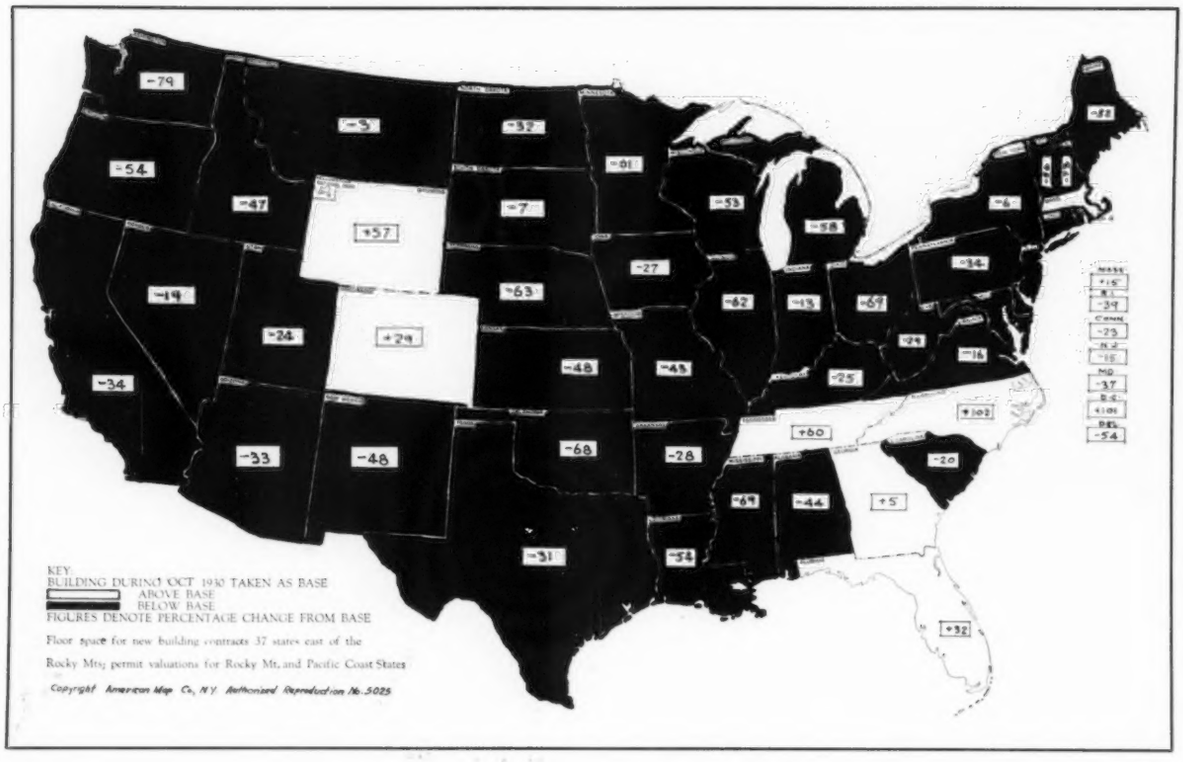


BUILDING TRENDS AND OUTLOOK

By L. SETH SCHNITMAN

Current Conditions

The October building map showed only six states east of the Rocky Mountains where current contracts, on a floor space basis, were larger than in October, 1930. These states were Massachusetts, District of Columbia, North Carolina, Tennessee, Georgia and Florida. In the previous month, thirteen states showed larger building contract totals than were reported in September, 1930. In August, nine states showed contract gains over the corresponding month of last year.

Of the states to show improvement in October, only four reported gains in September and only two showed advances in August. Massachusetts, District of Columbia, North Carolina and Florida showed gains in September while only Massachusetts and the District of Columbia have registered three consecutive monthly advances over 1930, beginning with August.

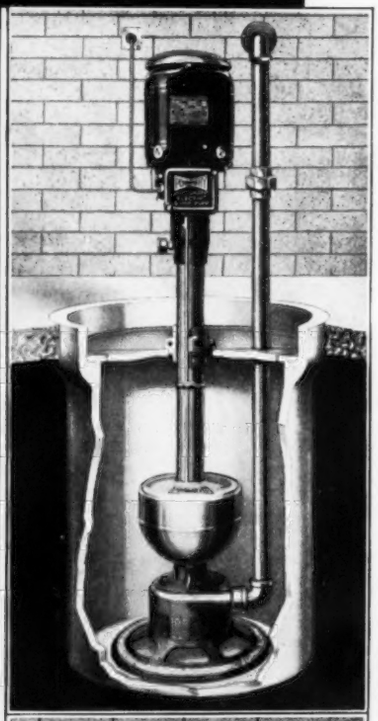
The October dollar contract total for all types of construction in the 37 eastern states as a whole amounted to $242,000,000, compared with $251,000,000 in September and $337,000,000 in October, 1930; thus the decline from the previous month amounted to 4 per cent while the loss from a year ago represented 28 per cent.

For the elapsed months of 1931, construction undertakings east of the Rockies aggregated $2,805,000,000 as against $4,020,000,000 in the similar 1930 period; the cumulative decline from 1930 was 30 per cent. Ten-month totals showed a loss of 36 per cent in nonresidential work; a decline of 29 per cent in public works and utilities; and a decrease of 23 per cent in residential building.

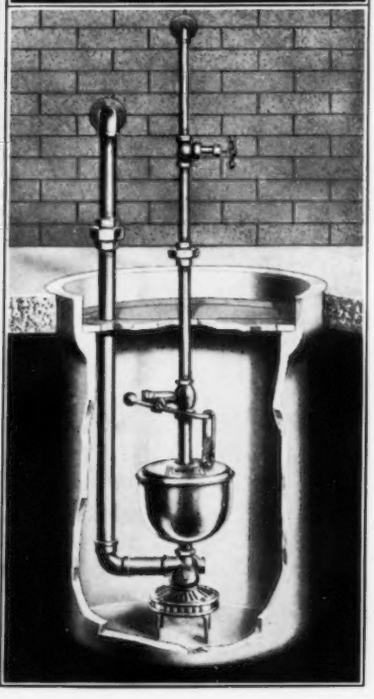
Since residential building is the class expected to show earliest revival, some further analysis of the residential figures for 37 states is appropriate. Total contracts in dollars declined 23 per cent in the first ten months of this year, as stated above; but total new residential floor space declined only 13 per cent. In new floor space contracted, the metropolitan New York territory was 22½ per cent ahead of last year at the end of October; the Central Northwest territory was just abreast of last year's 10-month program; the other territories were behind. While one- and two-family houses in the entire territory east of the Rocky Mountains were 17 per cent behind last year in dollar volume, they were only 9 per cent behind in number of buildings and 10 per cent behind in total floor space. Apartments and hotels were 34 per cent behind in dollar volume, and only 21 per cent behind in new floor space; these last figures were pulled down by the drastic decline in hotel projects; apartments and apartment hotels (exclusive of hotels proper), showing declines of only 26 per cent in dollar volume and 15 per cent in new floor space.

RUST PROOF

COPPER AND BRONZE THROUGHOUT



PENBERTHY AUTOMATIC ELECTRIC SUMP PUMP



PENBERTHY AUTOMATIC CELLAR DRAINER (Water Operated)

PENBERTHY PRODUCTS

THE architect need not be told the many advantages of using copper and bronze in the construction of equipment for the removal of seepage water from basements, elevator sumps, piping tunnels, scale pits, etc.

Penberthy Automatic Electric Sump Pumps and Automatic (water operated) Cellar Drainers are built of copper and bronze throughout . . they cannot rust.

The design and workmanship of Penberthy Pumps are as outstanding as the quality of the materials used in them. Consequently, these pumps are trouble-proof as well as rust-proof.

There is a type and size of Penberthy Pump for every purpose. Sump covers for both electric and water operated units can now be supplied at slightly additional cost. Penberthy Pumps are stocked by leading jobbers everywhere.

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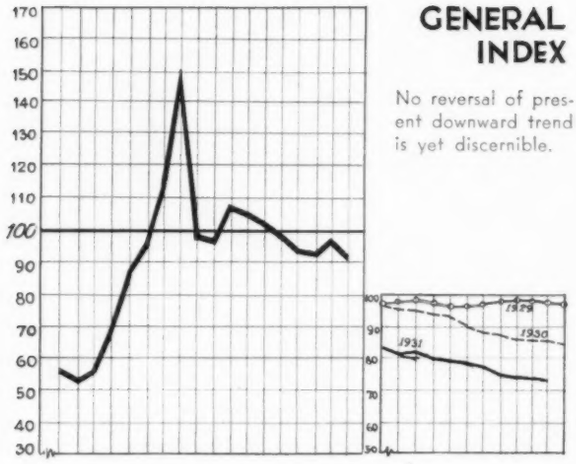
Established in 1886 — DETROIT — Canadian Plant Windsor, Ont.

PENBERTHY PUMPS REMOVE SEEPAGE WATER

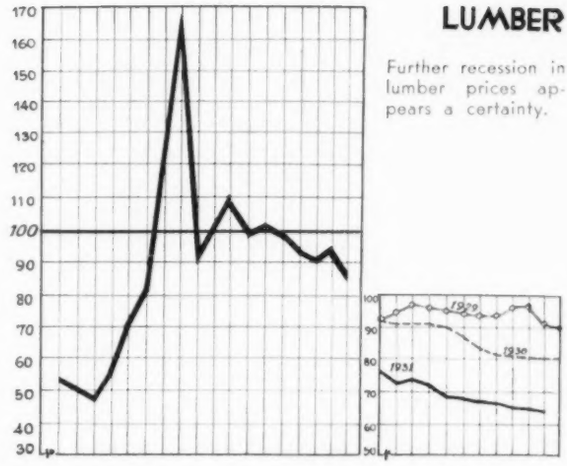
WHOLESALE PRICES FOR BUILDING MATERIALS

1926 Monthly Average—100



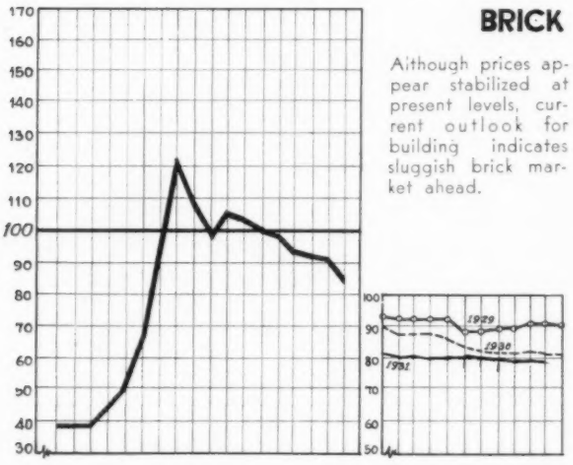
GENERAL INDEX

No reversal of present downward trend is yet discernible.



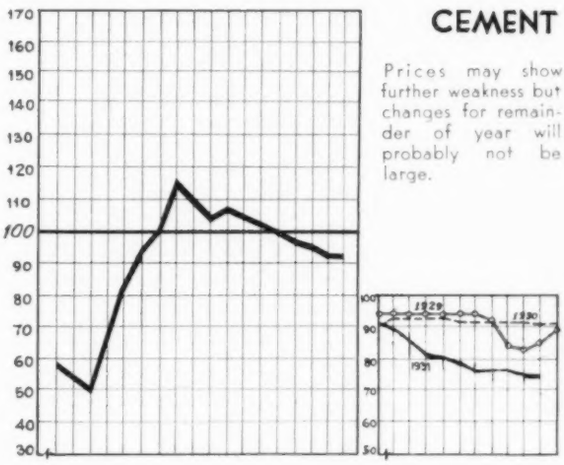
LUMBER

Further recession in lumber prices appears a certainty.



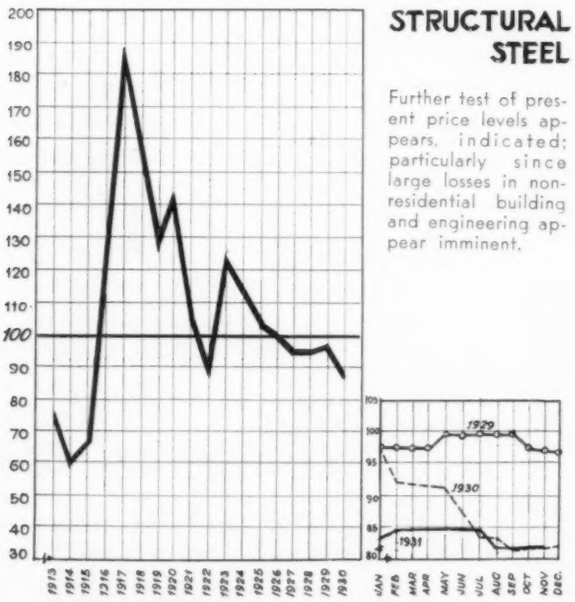
BRICK

Although prices appear stabilized at present levels, current outlook for building indicates sluggish brick market ahead.



CEMENT

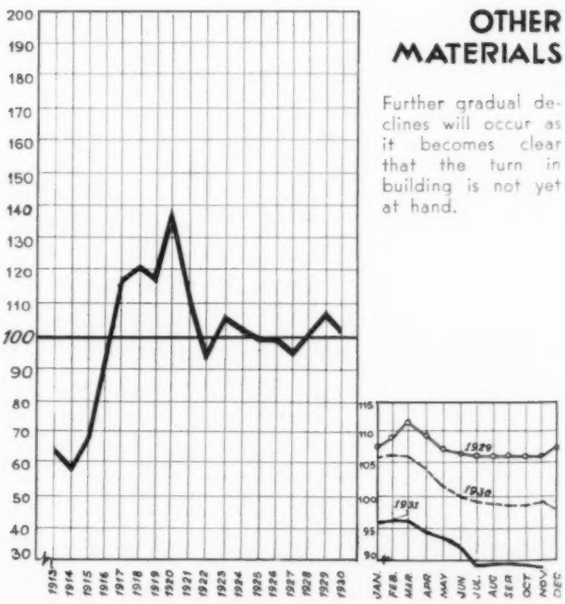
Prices may show further weakness but changes for remainder of year will probably not be large.



data from the U.S. Dept of Labor

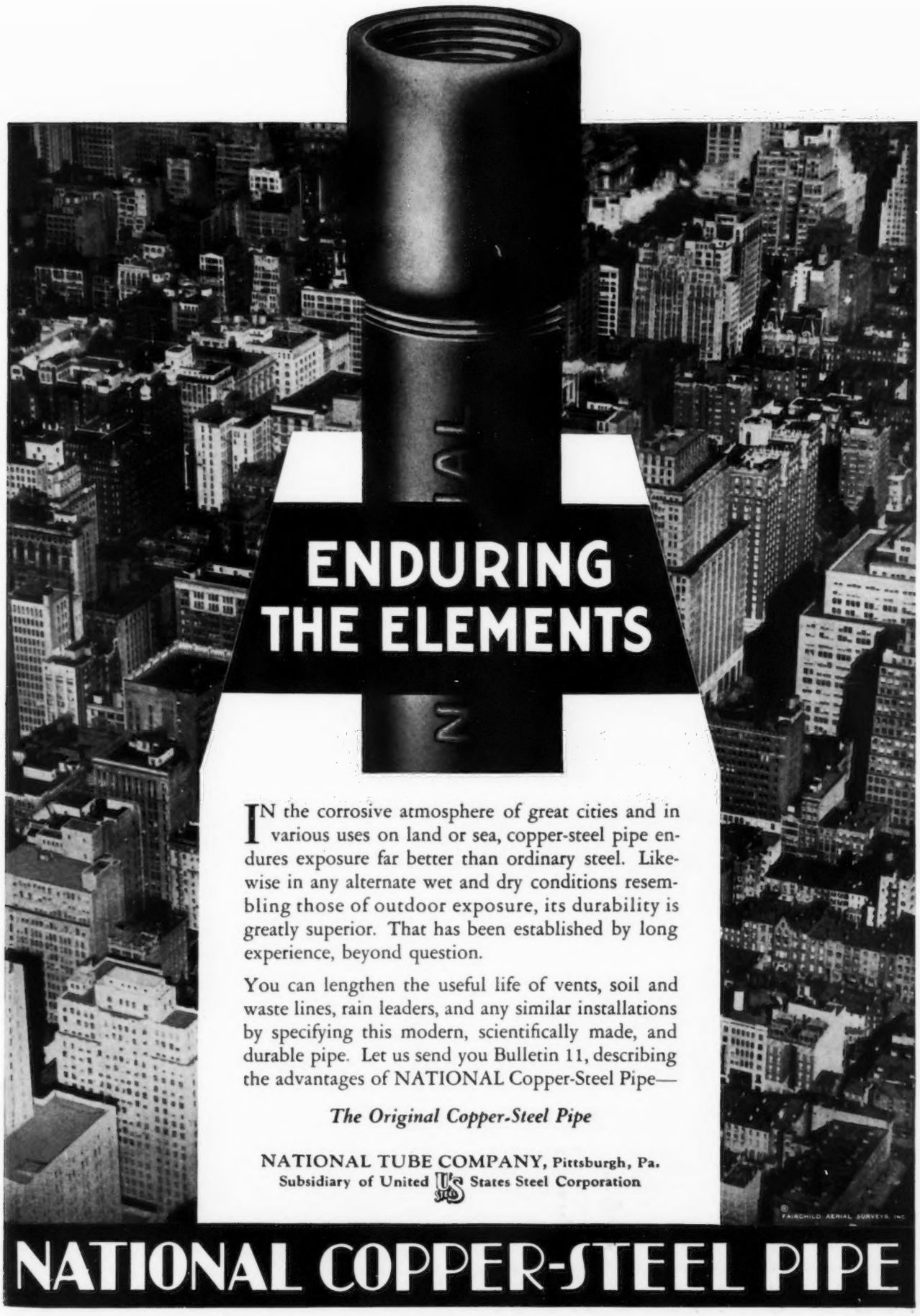
STRUCTURAL STEEL

Further test of present price levels appears indicated; particularly since large losses in non-residential building and engineering appear imminent.



OTHER MATERIALS

Further gradual declines will occur as it becomes clear that the turn in building is not yet at hand.



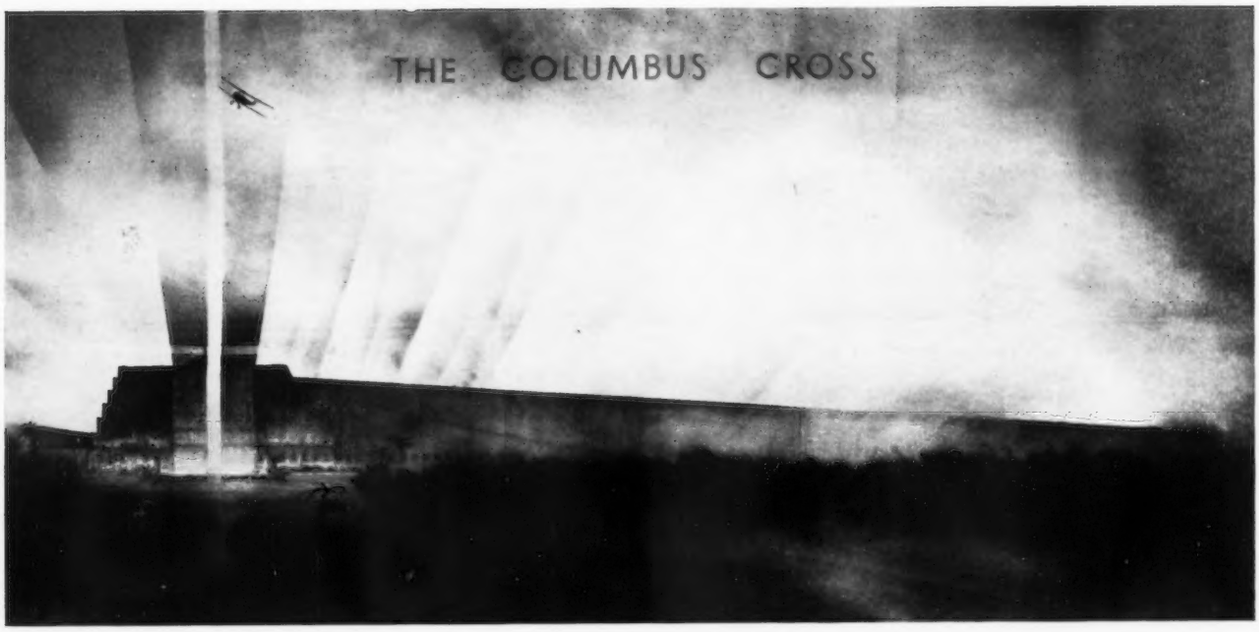
IN the corrosive atmosphere of great cities and in various uses on land or sea, copper-steel pipe endures exposure far better than ordinary steel. Likewise in any alternate wet and dry conditions resembling those of outdoor exposure, its durability is greatly superior. That has been established by long experience, beyond question.

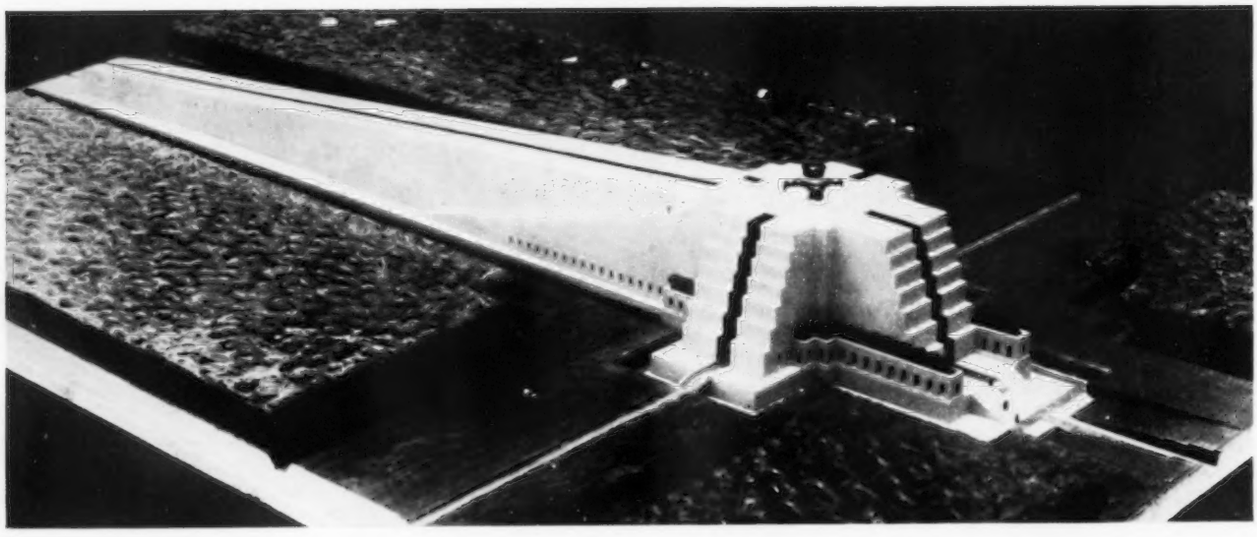
You can lengthen the useful life of vents, soil and waste lines, rain leaders, and any similar installations by specifying this modern, scientifically made, and durable pipe. Let us send you Bulletin 11, describing the advantages of NATIONAL Copper-Steel Pipe—

The Original Copper-Steel Pipe

NATIONAL TUBE COMPANY, Pittsburgh, Pa.
Subsidiary of United States Steel Corporation

NATIONAL COPPER-STEEL PIPE



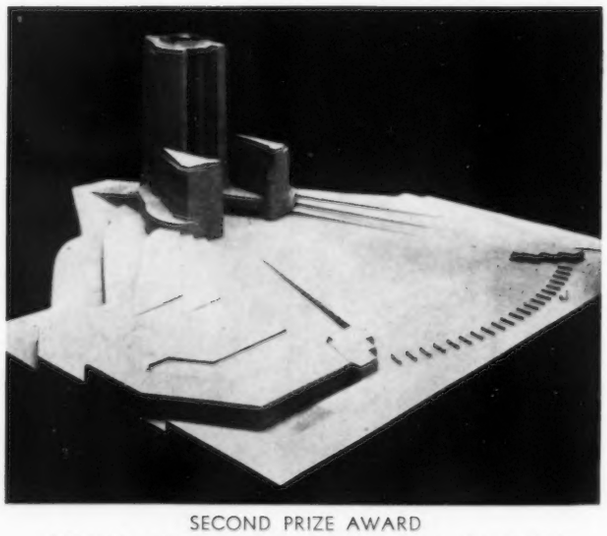


WINNING DESIGN BY J. L. GLEAVE, NOTTINGHAM, ENGLAND

J

COLUMBUS MEMORIAL COMPETITION AWARDS

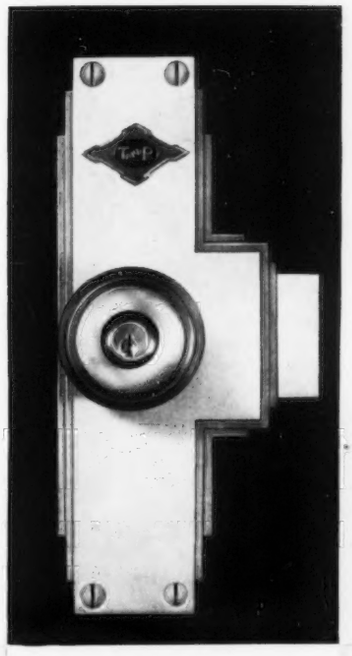
The report of the jury of award, signed by Eliel Saarinen, Frank Lloyd Wright and Acosta y. Lara, representing Europe, North America and South America, respectively, was printed in the November issue of The Architectural Record, pages 62-68 (advertising section). This report gives a critique of each design reproduced here.

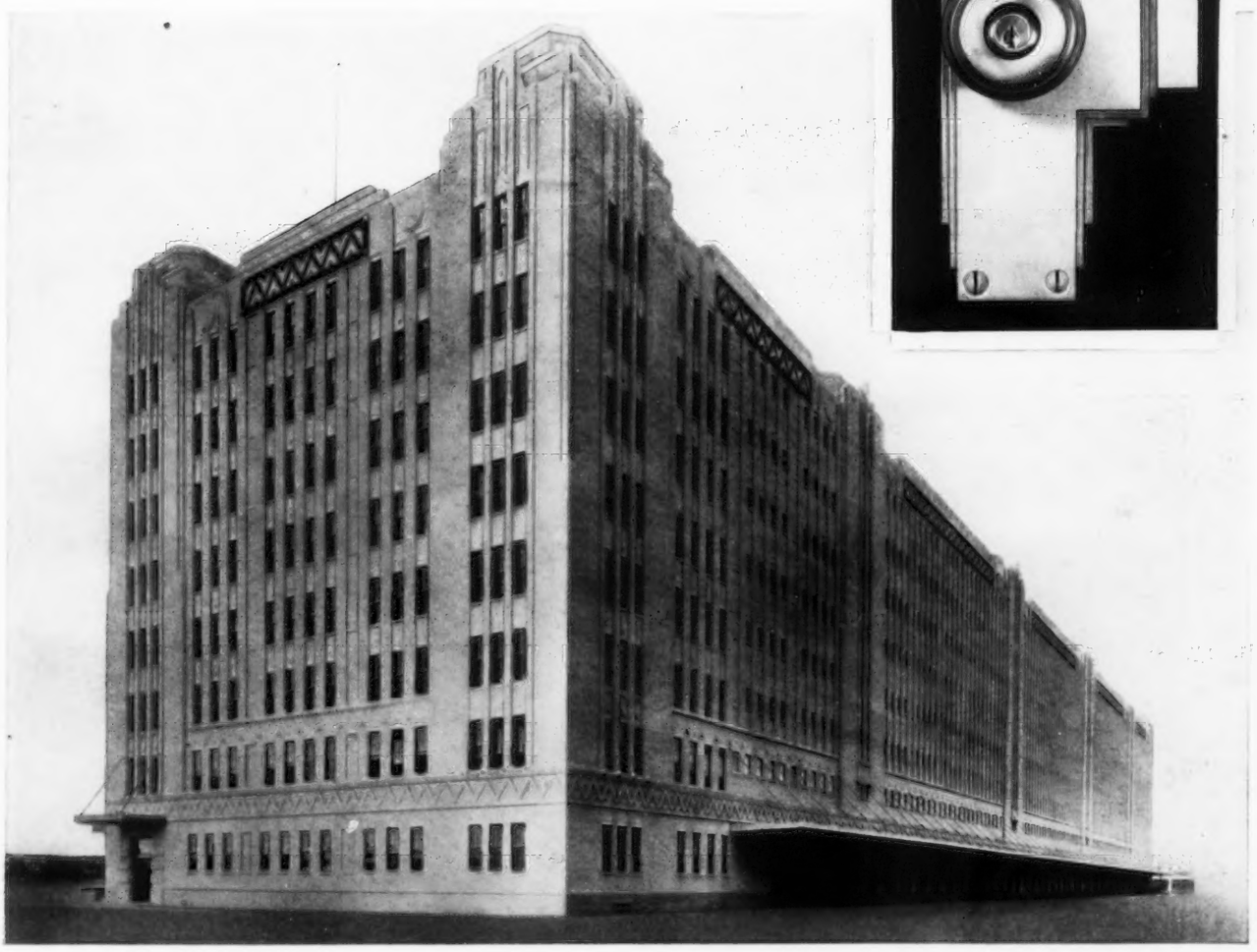


SECOND PRIZE AWARD
DONALD NELSON AND EDGAR LYNCH, CHICAGO

NEWS IN BRIEF

Corbin mounts guard on the TEXAS AND PACIFIC TERMINAL WAREHOUSE . . .





ARCHITECTURALLY, the TEXAS AND PACIFIC TERMINAL WAREHOUSE building is one of the most imposing and beautiful in the Southwest. The outside walls are of cream face-brick in combination with cut stone and richly colored tile inlay panels and ornamentations. The beauty of the building, however, is only incidental, as utility and convenience were the points to which the designers and engineers gave their most careful attention. The architect for both the new Terminal Warehouse and the new Passenger Station is Wyatt C. Hedrick, Inc., Fort Worth. The contractor for the Terminal Warehouse is Bellows-Maclay, Dallas; and for the Passenger Station, P. O. B. Montgomery, Dallas. The hardware for both structures is Corbin.

Above is one of the Corbin Unit Lock sets used on this building. The design is modernistic and the emblem of the Texas & Pacific Railway, which is black and red, gives an effect of individuality and distinction.

P. & F. CORBIN
SINCE 1849
New Britain, Conn., U. S. A.
The American Hardware Corporation, Successor
New York Philadelphia Chicago

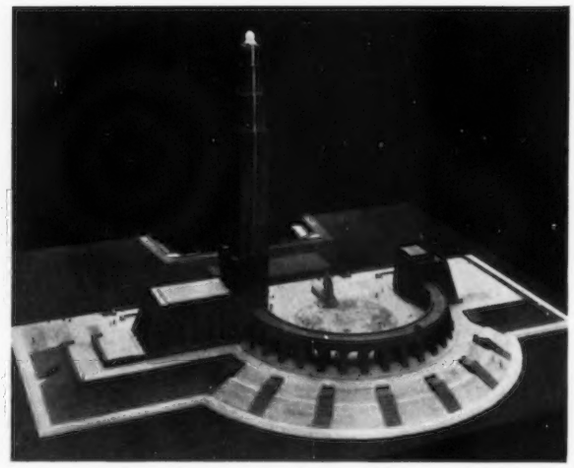
CORBIN

GOOD BUILDINGS DESERVE GOOD HARDWARE

COLUMBUS MEMORIAL AWARDS

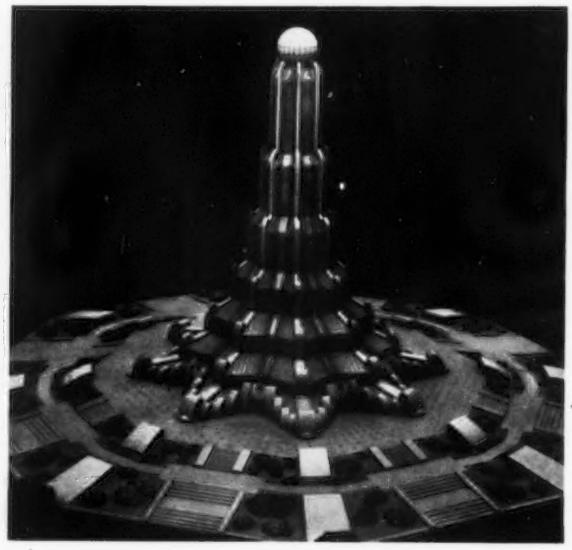
Ferrez

THIRD AWARD
JOAQUIN JAQUERO PALACIOS AND
LUIS MOYA BLANCO, SPAIN

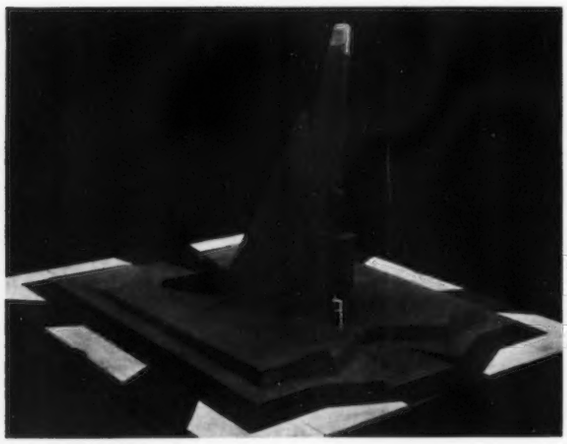


MENTION
CORBETT, HARRISON & MacMURRAY,
RODGERS AND POOR, AND W. K.
OLTAR-JEVSKY, NEW YORK CITY

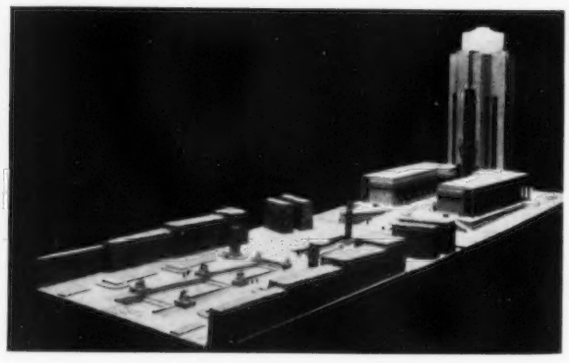
FOURTH AWARD
THEO LESCHER, PAUL ANDRIEU, O. ZAVARONI,
MAURICE GAUTHIER, PARIS



MENTION
DOUGLAS ELLINGTON
ASHEVILLE, N. C.



MENTION
PIPPO MEDORI, ROME



MENTION
JOSEPH WENTZLER, DORTMUND, GERMANY

KOHLER MATCHED FIXTURES

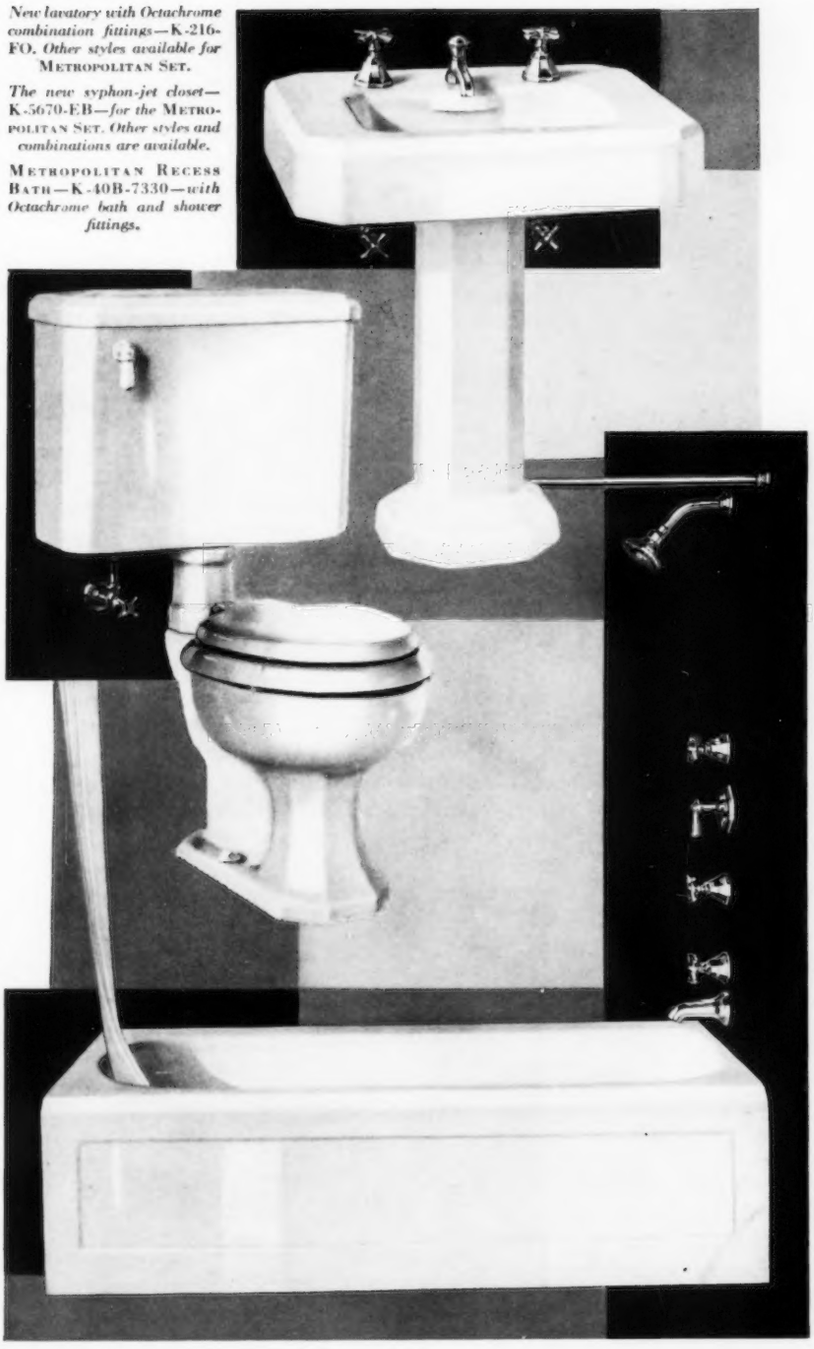
give you something new to say

. . . . and specify!

New lavatory with Octachrome combination fittings—K-216-FO. *Other styles available for* METROPOLITAN SET.

The new syphon-jet closet—K-5670-EB—*for the* METROPOLITAN SET. *Other styles and combinations are available.*

METROPOLITAN RECESS BATH—K-40B-7330—*with Octachrome bath and shower fittings.*



EVER since Kohler announced that, for the first time in the history of the plumbing industry, you could write-in *matched sets* of fixtures and fittings, architects have been thinking quick and working fast. Right now, many are *proving* that this new departure walks away from the beaten track by putting more Kohler sets into their plans.

We can say flatly that this step by Kohler marks the first definite advance in the industry for years. (You have been able to match up your own sets before, of course, and to accept the manufacturer's suggestions.) But never before have you been able to use sets of fixtures that agree in every detail of design and construction — from smooth shining surface to distinguished fittings.

Made for each other, down to the last detail

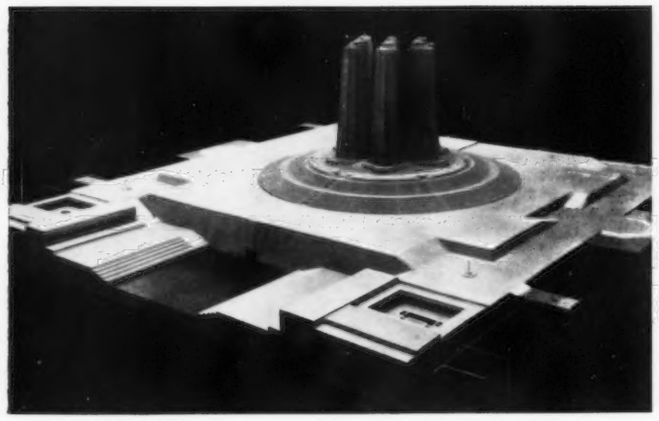
The illustrations show clearly the features you can explain to clients. Notice how each piece harmonizes with the others. Edges are square. Corners, usually rounded, turn at abrupt angles. Rims are conveniently wide and flat, affording ample room for shaving cream, tooth-brush, powder. Surfaces are plain and modern.

Yet Kohler matched fixtures are popularly priced! Designs are so planned that a selection of other fixtures in the same set can be made to fit purse and purpose. The closet, for example, comes in syphon jet, reverse trap and wash-down models, and in tank or flush valve combinations. The point is that with any fixtures in a particular group, the entire installation is a decorative unit.

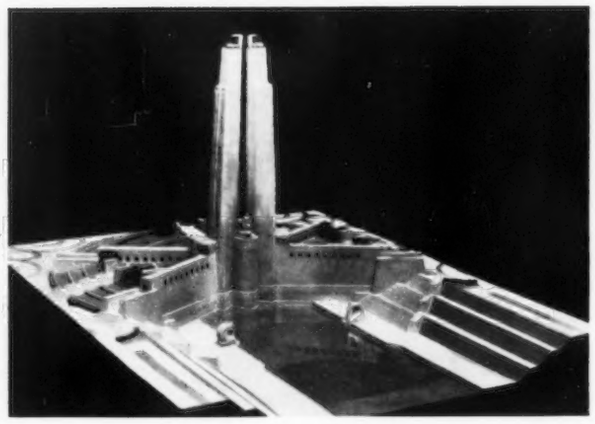
If possible, drop in a Kohler showroom and see the fixtures at first hand. Kohler Co. *Founded* 1873. Kohler, Wis. — *Shipping Point*, Sheboygan, Wis.—*Branches in principal cities.* Look for the Kohler trade-mark on each fixture and fitting.

KOHLER OF KOHLER

COLUMBUS MEMORIAL AWARDS



MENTION
LOUIS BERTHIN, GEORGES DOYON,
GEORGES MESTEROF, PARIS



MENTION
WILL RICE AMON, NEW YORK CITY

HOUSE COSTS FOUND EXCESSIVE

The bulk of the country's owner-occupied homes are obsolete in the opinion of a committee of President Hoover's Conference on Home Building and Home Ownership, it is stated in an Associated Press dispatch. The home, contends the committee, has not kept up to the advance in America's standard of living. The cause of the home's backsliding is found by the report to rest on too high building costs.

"New houses meeting an acceptable standard of living are too expensive for two-thirds of the population of the United States," it said. The solution, the report holds, lies in mass production of houses. It was turned in by Alfred K. Stern, director of the Julius Rosenwald Fund, as chairman of the committee on large-scale operations.

ENGINEERS TO SPEED UP PUBLIC WORKS

Through the American Engineering Council, the engineering profession has framed a public works program characterized as a necessary approach to answering the question: "What work can now be provided the millions not employed?"

This program includes all construction undertaken by national, state, county and municipal governments.

"The American people have been greatly disappointed because public developments have not served the useful purpose they anticipated in relieving unemployment," the Council's announcement states.

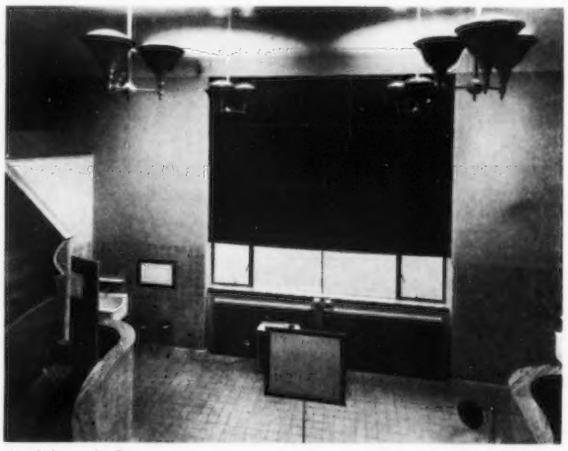
"It is believed that work on public projects for which appropriations have been made can be materially speeded up. It is further believed that a careful canvass made throughout the country would bring to light a sufficient amount of necessary work when financed to provide employment during the next six months or more for a very large number of the unemployed. It is believed that this necessary work can be financed without great difficulty.

"The engineering profession is now organized and ready, through state engineering committees, local engineering societies and in cooperation with many other groups, including the President's Unemployment Organization, to proceed aggressively."

EXCLUDING DAYLIGHT

Complete exclusion of daylight is necessary for efficient reproduction on movie screens in schoolrooms and auditoriums. Surgical operating rooms, X-ray rooms, radiographic and microscopic projection rooms also require complete exclusion of daylight. X-ray or fluoroscopic rooms where exposures are made can be converted into dark rooms for developing the negatives when photographically safe light-proof curtains that exclude the light completely are provided.

Electrically or hand-controlled light-proof equipment can be built in with other construction details in schools and hospitals.



Andel and Co.
SURGICAL AMPHITHEATER, BY COOLIDGE AND HODGSON, DESIGNED TO EXCLUDE DAYLIGHT

What does Service mean to You?

FROM a modest beginning of a plant 34 x 82 feet, erected in 1839, we have grown to the present sizeable factory of today, covering fourteen acres of floor space.

This is your factory, ready at all times to serve you with your requirements of builders' hardware. Our designs, service, and methods have kept pace with the changing conditions and we offer today the most distinctive builders' hardware manufactured, as evidenced by the forty-two special designs in French, English, and Modernistic Schools, recently created for the new Waldorf-Astoria Hotel of New York City.

Why not avail yourself of every service that we have built into our organization, for the use of satisfied customers, since 1839.

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RUSSELL & ERWIN
DISTINCTIVE
HARDWARE
Hardware that lasts – Base Metals of Bronze or Brass

RUSSELL & ERWIN MANUFACTURING COMPANY
(The American Hardware Corp., Successor)
New Britain, Connecticut New York Chicago London

GREATER STRENGTH LIGHTER WEIGHT . . INCREASED BEAUTY

From an architectural standpoint, Stainless Steel is uniquely practical. It can be made many times stronger than ordinary steel and even most other alloys. This permits an important reduction in the size and weight of metal members —being "Stainless" it also provides permanence and deep, rich beauty. • Genuine Stainless Steel has that elusive look of quality which architects call "class"—there is a difference, and yet "Stainless" is actually less expensive than unsatisfactory substitutes. • Genuine Stainless Steel is manufactured only under the patents of American Stainless Steel Co., Commonwealth Building, Pittsburgh, Pa. Write for our interesting new booklet.

STAINLESS

STAINLESS STEEL

LIGHTWEIGHT MATERIALS TO BE DESCRIBED IN GOVERNMENT REPORTS

A series of reports describing the manufacture, properties, and uses of lightweight materials that reduce building costs is now being prepared by H. Herbert Hughes, Building Materials Section, United States Bureau of Mines, Department of Commerce.

The first of these papers is a general summary of the entire field. The rapidly growing importance of home insulation is stressed; the advantages of soundproofing, acoustical treatment, and fireproofing in all types of construction are pointed out; and several examples of unusual architectural treatment of buildings are mentioned.

Succeeding reports will be devoted to a detailed description of an individual material or group of materials. The tentative outline for the series includes burned shale aggregates, cinder concrete, slag concrete, sawdust concrete, aerated concrete, natural volcanic rocks, gypsum products, ceramic products, and mineral wool.

The Bureau will welcome suggestions relating to any phase of the study. Communications regarding these reports should be addressed to the U. S. Bureau of Mines, Washington, D. C.

THE LOAN BANK PLAN

The President's proposal for a system of home loan discount banks, recently announced, is described by P. W. Kniskern, general manager of the Continental Mortgage Guarantee Company of New York, in the November 21 issue of *Real Estate Record and Builders' Guide*, as "not a hastily prepared program, but a studied effort."

Mr. Kniskern goes on to say:

"Before presenting this plan to the American public the President called into consultation a number of the recognized leaders in real estate and real estate financing and gave many hours of his personal time to discussing various proposals with this group.

"In any present consideration of this proposal one must keep in mind the thought expressed in one of the President's closing paragraphs, namely, that these 'proposals are put forward as suggestions . . . to give clarity to the central idea rather than as inflexible conclusions,' likewise his further thought that Congressional action is necessary to put it into being, as well as the need for development of many of its parts.

"Generally following the organization scheme of the Federal Reserve Banks, but in no wise following with them, the plan provides for the affiliation of the present existing lending institutions into a central national institution through membership in geographical subdivisions thereof.

"It does not contemplate the establishment of further lending institutions, but rather establishes a new source of funds for existing institutions. This is quite an important distinction. As the President points out, it will provide a better organization of this particular type of credit.

TODAY'S HOME OWNERS PLACE A PREMIUM ON CONVENIENCE

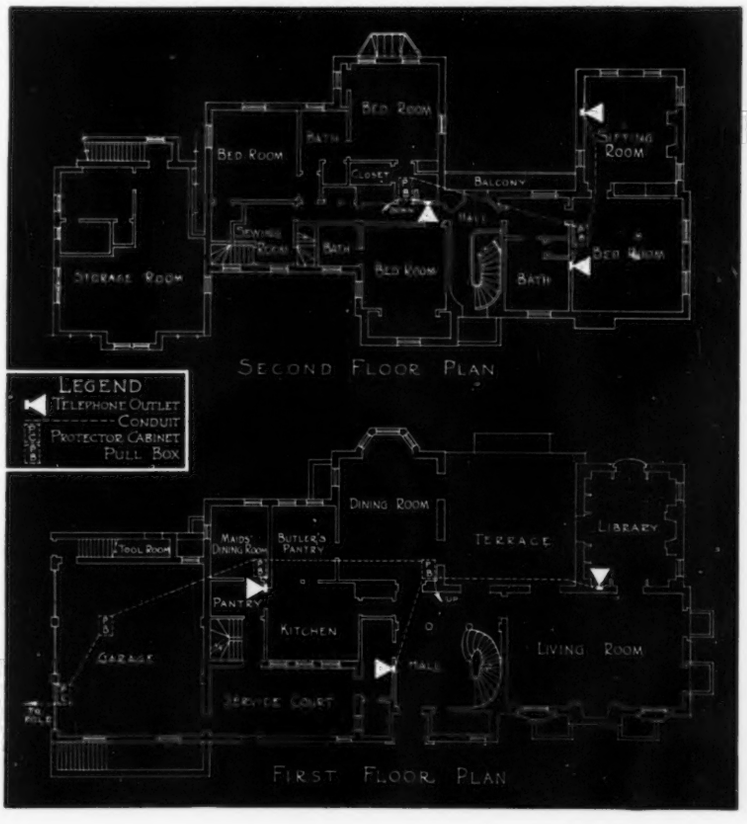
ONCE, Americans were content with homes made pleasant to *look* at. Now they ask also for homes that are easy to *live* in. Every added convenience, every contribution to living comfort, increases their valuation of a house and raises their estimate of its architect.

One of the modern and most welcome of these conveniences is the provision for *enough* telephones. Architects everywhere have found that adequate facilities for telephones pay handsome dividends in owner-satisfaction—in time and energy saved for entire households.

By planning for telephone conduit in walls and floors, it is easy to provide telephone outlets at the most desirable locations in all the important rooms. With an abundance of outlets, telephones can be moved from place to place as occasion demands . . . all wiring is concealed . . . and there is much greater freedom from service interruptions.

You can assure full and flexible telephone convenience to your clients by consulting the local telephone company. Their advice and assistance is given gladly, without charge. Just call the Business Office.

Built-in telephone conduit and six outlets provide for telephone convenience in the residence of Mr. Herbert I. Lord, 107 Touraine Road, Village of Grosse Pointe Farms, Detroit, Michigan.
ROBERT O. DERRICK, Architect, *Detroit*



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CUSTOM BUILT
of Bronze, Aluminum Alloy or Nickel Silver

ADVANTAGES

VENTILATION — Easily controlled for varying conditions.

MAINTENANCE — Upkeep reduced to minimum.

CLEANING — Exterior can be washed from the inside.

SAFETY — Difficult for anyone to fall or leap out.

STRENGTH — All joints strongly welded.

Write for specifications and details.

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RUSTLESS METAL STORE FRONTS, SEALAIR WINDOWS, DOORS AND ARCHITECTURAL CASTINGS

"This plan, soundly organized and soundly administered, should through bonds of the discount bank, provide a very attractive and popular investment. While not a government obligation, it will nevertheless be a national obligation. Through quantity and uniformity it should enjoy a ready marketability which no security founded upon real estate now has.

"The discount bank will purchase, not the mortgages, but the obligations of the member institutions secured by the deposit of first mortgages. This obligation will represent not over 50 per cent of the unpaid balance of standing or unamortized mortgages and not over 60 per cent of amortized mortgages, or in other words, 25 per cent of the appraised value of the property for standing loans and 30 per cent of the value for amortized loans.

"The properties must be used for homes, either city or farm, and the maximum loan admissable is set at $15,000. By this limitation each $1,000,000 of bonds issued will be secured by the mortgage obligations of not less than 130 home owners. In practice this will possibly be closer to 400 or 500 home owners.

"The discount banks will be limited in outstanding bonds to twelve times their capital as compared to the twenty times or greater ratio now quite generally accepted. The outstanding bonds furthermore will be only 50 per cent to 60 per cent of the mortgage collateral. Thus there is injected a new, extremely conservative basis. This conservative ratio is a necessary and desirable feature from the viewpoint of the investor and protects him against the variations in appraisals that today must honestly exist.

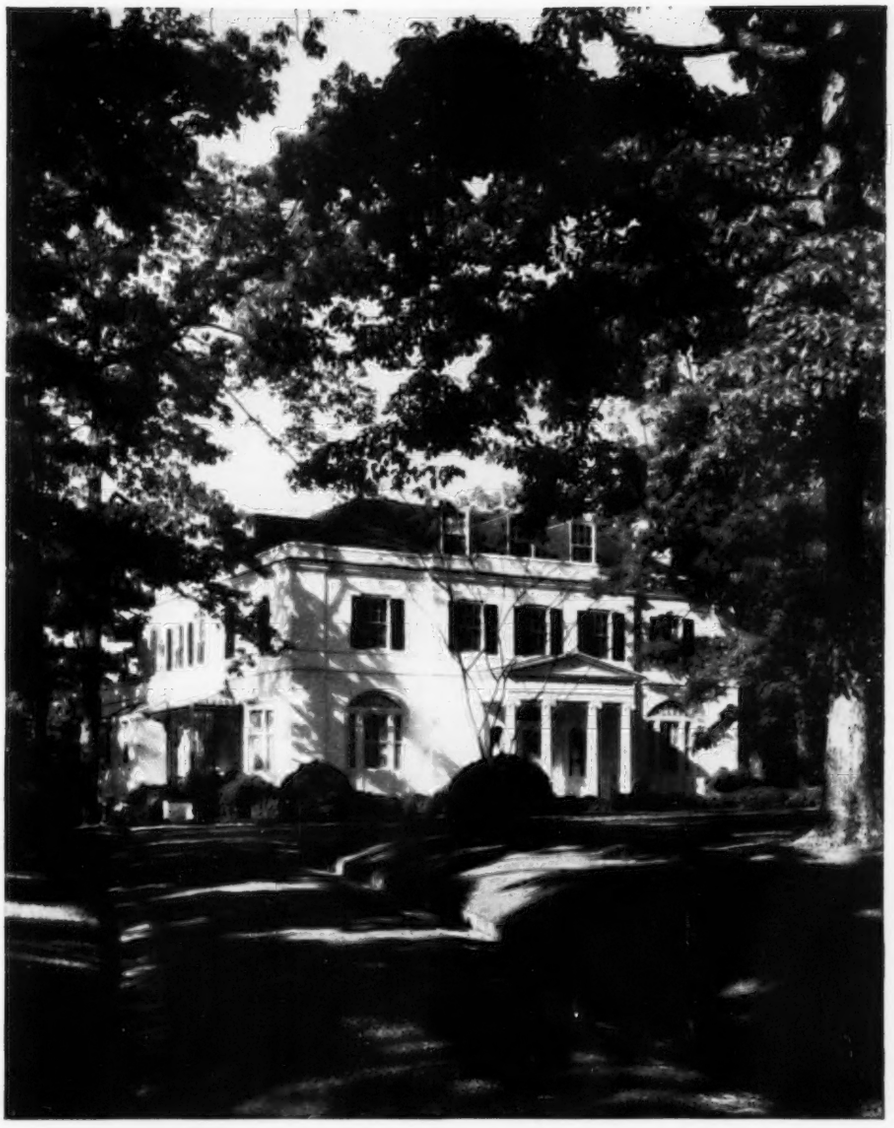
"Behind such bonds there will then be the capital of the discount banks, the obligation of the originating institution and the mortgages themselves, a high degree of marketability as explained, and the added feature of eligibility as security for governmental and postal deposits.

"Such a high grade security should attract new money into the field and help to overcome some of the present lack of faith in real estate securities.

"It is erroneous to expect immediate help for present difficulties from this program, for it will take many months to create the machinery necessary and put it into operation. Congress must enact the necessary legislation and subscriptions must be taken in, to say nothing of the myriad of details that must be organized, not the least of which is the proper control of appraisals.

"The eastern part of the country probably does not fully realize the need of relief and permanent help in this line as much as does the west, where the need for ample funds at reasonable rates is probably far greater.

"This program will not and cannot be panacea to all disappointed mortgage borrowers, for the same rules of sound mortgage lending as are necessary in any present procedure must be strictly adhered to in this plan. It may, however, have a tendency to bring about greater uniformity of procedure."



These two distinctive homes are glazed with L·O·F Quality Glass, a vital factor in achieving their air of distinction.

• •

Upper—Residence of Mr. Harry L. English, Atlanta. Lower — Mrs. J. J. Goodrum's home, Atlanta. Architects: Hentz, Adler & Shutze. Contractors: Collins, Holbrook & Collins, Atlanta.

THEIR graciousness and symmetry of line; the cordial greeting that their *atmosphere* extends; the cheery sparkle, brilliant polish and lasting beauty of their windows, all say, "I was created by an architect who specified only the finest."

LIBBEY·OWENS·FORD
QUALITY GLASS

LIBBEY•OWENS•FORD GLASS COMPANY, TOLEDO, OHIO

Manufacturers of Highest Quality Flat Drawn Window Glass, Polished Plate Glass and Safety Glass; also distributors of Figured and Wire Glass manufactured by the Blue Ridge Glass Corporation, of Kingsport, Tennessee.

STORE FRONTS

KAWNEER "B" CONSTRUCTION

A modern frame for modern merchandise . . . Simple in construction . . . Surfaces unblemished by rivets or screws . . . Strong and durable . . . Easily installed, presenting a unified appearance in the finished front . . . Made of rolled or extruded Bronze or Aluminum Alloy. Write for Full Size Details and New Catalog "N."

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PATENTS AND COPYRIGHT APPLIED FOR

THE PRESIDENT'S CONFERENCE ON HOME BUILDING AND HOME OWNERSHIP

By MICHAEL A. MIKKELSEN

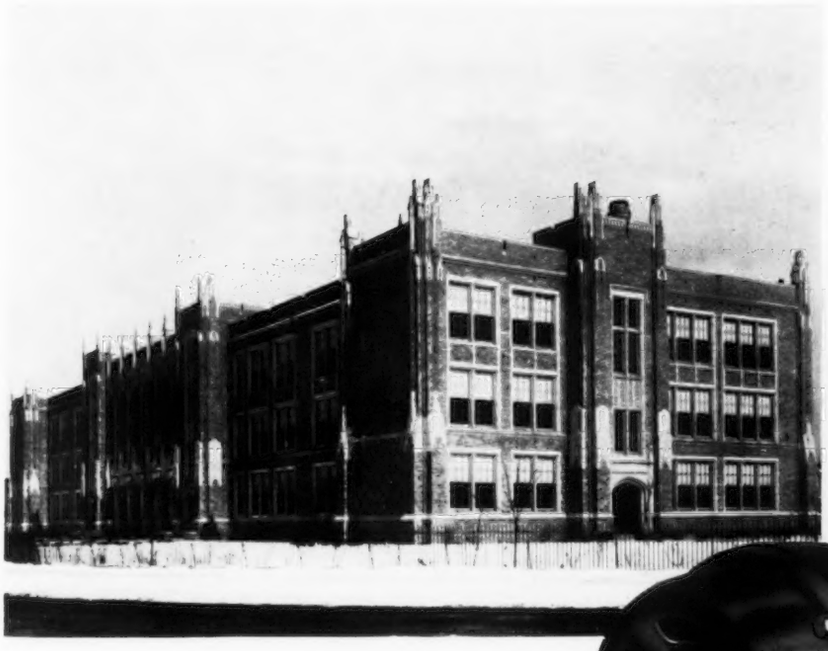
(*Continued from page 464, Editorial Section*)

be done fairly quickly, all the existing buildings would be razed and the site completely cleared.

"Then the city would sell two outer strips along the length of the block; the strips would be about 32 feet deep, a sufficient depth on which to build model houses not exceeding two rooms in depth. As our ordinary city blocks are often 200 feet in depth and vary in length from 400 to 800 feet, this would mean that the site would then consist of two outer strips each 32 feet deep (which had been sold to a private corporation on which to build houses) and a space 136 feet wide by 400 to 800 feet long between them. This interior space would be reserved by the city and developed as a small park and playground. . . .

"A limited dividend corporation equivalent to the English public utility society, would then proceed to build model dwellings upon these two outer strips. They would be able to build on the entire land sold to them, as the land would be of no greater depth than would be just appropriate for the development of the right kind of houses, with half of the rooms fronting on the street and the other half of the rooms fronting on this delightful, interior small park that the city would develop. Such a scheme, we believe, would entirely meet the constitutional and legal difficulties involved in the prohibition of taking private property for other than a public use. It would also meet the financial difficulty, for it would reduce the cost of slum clearance by a very considerable amount, as it would be possible to sell off these outer strips at a price that would recoup the local authorities for a third of the cost of the land. . . .

"While no local authority in America has yet carried out this method of slum clearance, there seems to be some likelihood of its soon being put to the test. Such a plan was suggested about a year ago by the writer for the city of Newark, New Jersey, a city of 442,337 inhabitants across the Hudson River from New York City. Two blocks in a slum district district in that city have been acquired by a great insurance company, the Prudential Insurance Co., which is desirous of ridding the city of slums and to that end has embarked on several model housing schemes. The local authorities have joined with the Prudential Insurance Company in just such a partnership as we have described, and unless prevented by the courts it is proposed to carry out this plan in the near future. That the plan proposed is a practical one, and one by which slum clearance can be achieved we have no doubt. We are frank to admit that without some such plan we see no way by which slum clearance can be achieved in the United States."



Alexander Hamilton Jr. High School, Cleveland, Ohio
Geo. M. Hopkinson, Architect
Geo. A. Hausman, Engineer

Wherever Quiet Motor Operation Is Desired . . .

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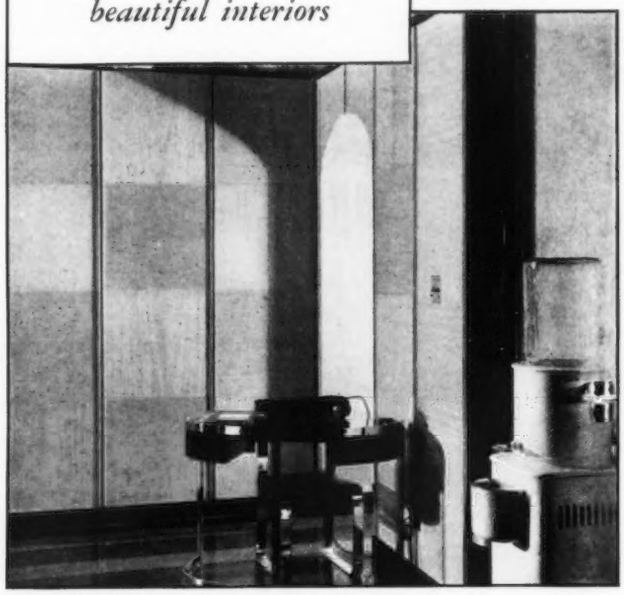

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Community Planning in Suburbs

In dealing with housing in the suburbs the conference has no unsolved legal problem to consider. Its task there is to suggest the application under varying conditions of legal principles already worked out in connection with city planning, building codes, zoning, control of subdivisions and the like. The relationship of the house to the community is a fundamental factor in good housing. The house is related to the school, the playground, the local business section, the civic center, rapid transit, highways and so on. The first step, therefore, towards good housing is a well-considered community plan.

Local Economic Surveys

To promote adequate community planning and city planning, a committee of the conference has prepared a standard form of questionnaire for use in local field surveys. It calls for data on population, families, economic conditions, rate of growth and other demand factors related to future building as well as occupancy and vacancy data with respect to existing residential, business and other buildings. The intention is to show both immediate and future construction requirements in each community and to provide eventually a national construction index.

The maintenance of the balance between one-family dwellings and apartments contemplated by community plans may be accomplished partly by zoning and partly by building code provisions to the effect that multiple dwellings must have large yards and courts. Such provisions would help to prevent apartment houses from crowding out dwellings through inflating land values.

The planning principles incorporated, for example, in the layout of Radburn, N. J.—by-passing general traffic, centering apartment houses and business buildings on wide avenues, and elsewhere using streets with narrower roadbeds and sidewalks, smaller sewers and water mains, and paving of lighter construction—would tend to keep down assessments for street improvements, and consequently lot values, in the private house zones.

Subdivision Control

Control of the layout, street improvement and sale of subdivisions is essential in order not only to safeguard the community and city plan but to assure small home seekers that it is safe to buy lots with a view to building on them later—that the lots are likely to have an appraised value equal to the purchase price when offered as security for a building loan. Some degree of control is now exercised by nearly 100 cities. Dallas, Texas, and Schenectady, N. Y. provide, for example, that new streets may not be opened unless the petitioners guarantee in advance the cost of the public improvements subject to special assessments. This

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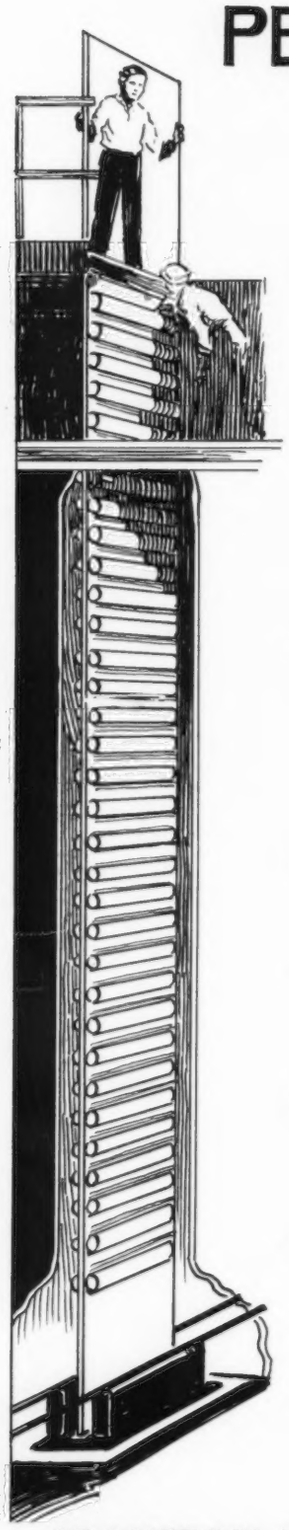

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measure, if generally enforced, would prevent municipalities from incurring debt to extend to city in advance of actual need.

The general aim of the conference is twofold: (1) to promote health and comfort in old buildings for that part of the population whose income obliges them to live in "used" houses and (2) to promote the construction of new housing—dwellings and apartments—for the rest in accordance with variable needs but always from the point of view of family, social and community welfare. The most numerous income group is that with annual incomes of $1,800 to $2,500. If means can be devised permitting this group to own or rent modern homes, the higher income groups will benefit automatically from such means.

There is no intention in this article to minimize the value of design, construction, equipment and other factors related to the house apart from the land. However, their possibilities are at present largely neutralized by obsolete credit facilities and obsolete public policy with respect to urban land. The problems of credit and public policy are the more complex and pressing, and the fact that the conference is bringing a consensus of informed opinion to bear upon their solution insures for its proceedings a maximum of educational influence.

The broad and varied field to be covered is indicated by the following list of committees:

Committees	*Chairmen*
1. Types of Dwellings	John Ihlder, Executive Director, Pittsburgh Housing Association, Pittsburgh, Pa.
2. Fundamental Equipment	Prof. Collins P. Bliss, Dean of the College of Engineering, New York University, New York, N. Y.
3. Kitchens and Other Work Centers	Miss Abby L. Marlatt, Professor of Home Economics, Dir. of Courses in Home Economics, University of Wisconsin, Madison, Wis.
4. Utilities for Houses	Morris Knowles, Author of "Industrial Housing," Morris Knowles, Inc., Pittsburgh, Pa.
5. Subdivision Layout	Harland Bartholomew, President, National Conference on City Planning, St. Louis, Mo.
6. Business and Housing	Harry A. Wheeler, Former President of the Chamber of Commerce of the United States, Chicago, Ill.
7. Industrial Decentralization and Housing	Stuart W. Cramer, President-Treas., Cramerton Mills (provides homes for employees), Cramerton, N. C.
8. Blighted Areas and Slums	Abram Garfield, Architect, Member of the (National) Commission of Fine Arts, Cleveland, Ohio
9. Reconditioning, Remodeling and Modernizing	Frederick M. Feiker, Director, Bureau of Foreign & Domestic Commerce (formerly Managing Director, Associated Business Papers, Inc.), Washington, D. C.
10. Construction	A. P. Greensfelder, President, Associated General Contractors of America, St. Louis, Mo.
11. Design	William Stanley Parker, President, Architect's Small House Service Bureau, Boston, Mass.

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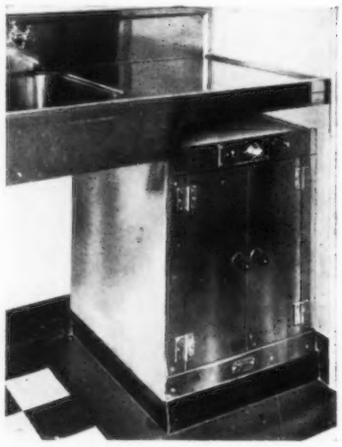

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12. City Planning and Zoning	Frederic A. Delano, President, American Civic Association, Chairman, Regional Plan of New York and Its Environs, Washington, D. C.
13. Finance	Frederick H. Ecker, President, Metropolitan Life Insurance Co., New York, N. Y.
14. Taxation	Dr. T. S. Adams, Professor, Political Economy, Yale University, and Economic Adviser U. S. Treasury Dept. since 1917, New Haven, Conn.
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17. Landscape Planning and Planting	Mrs. Junius S. Morgan, Princeton, N. J.
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19. Housing and the Community	Dr. Joseph Hersey Pratt, Past President of the American Climatological and Clinical Association, and of the American Society for Clinical Investigation, Boston, Mass.
20. Farm and Village Housing	Provost A. R. Mann, Cornell University (formerly Dean of N. Y. State Colleges of Agriculture and Economics), Ithaca, N. Y.
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B. Research	Professor James Ford, Department of Sociology, Harvard University, Exec. Dir. Better Homes in America, 1653 Pennsylvania Ave., N. W., Washington, D. C.
C. Legislation and Administration	Bernard J. Newman, Managing Dir., Philadelphia Housing Association, Philadelphia, Pa.
D. Education and Service	Dr. Albert Shaw, Editor, American Review of Reviews, New York, N. Y.
E. Organization Programs, Local and National	Miss Harlean James, Exec. Sec'y, American Civic Ass'n, Incorporated, Washington, D. C.
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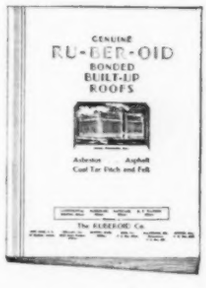

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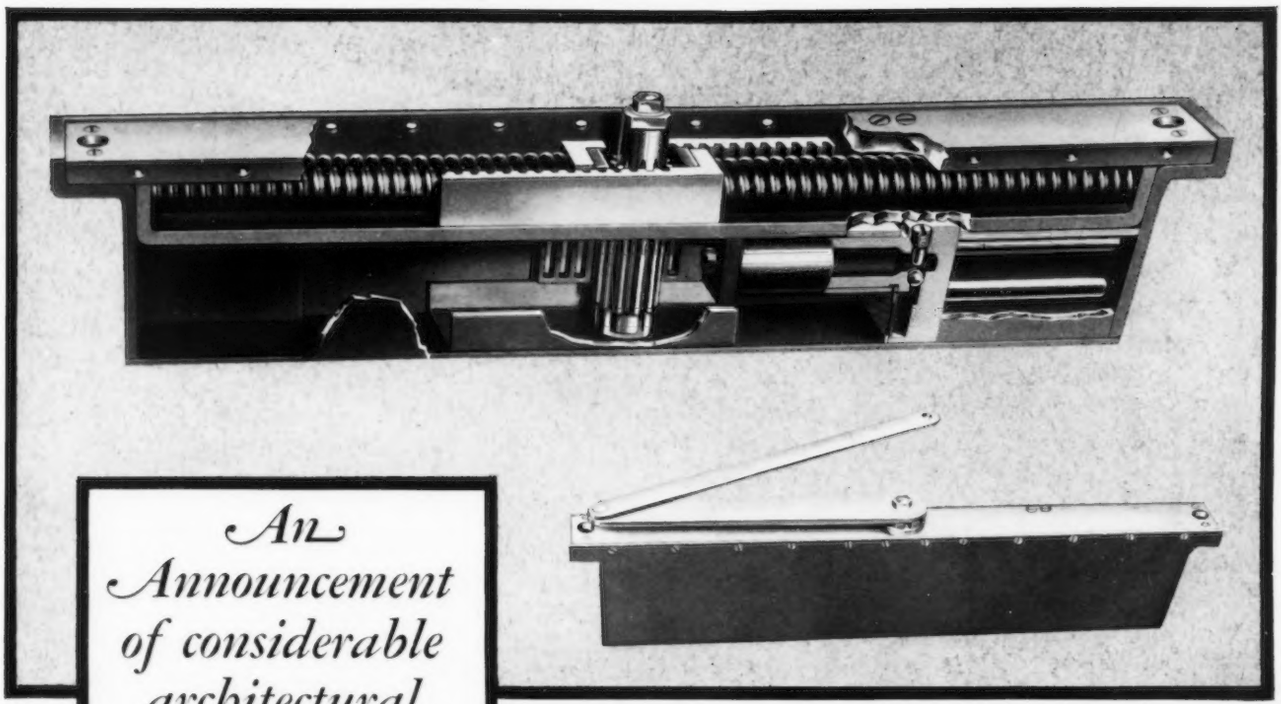

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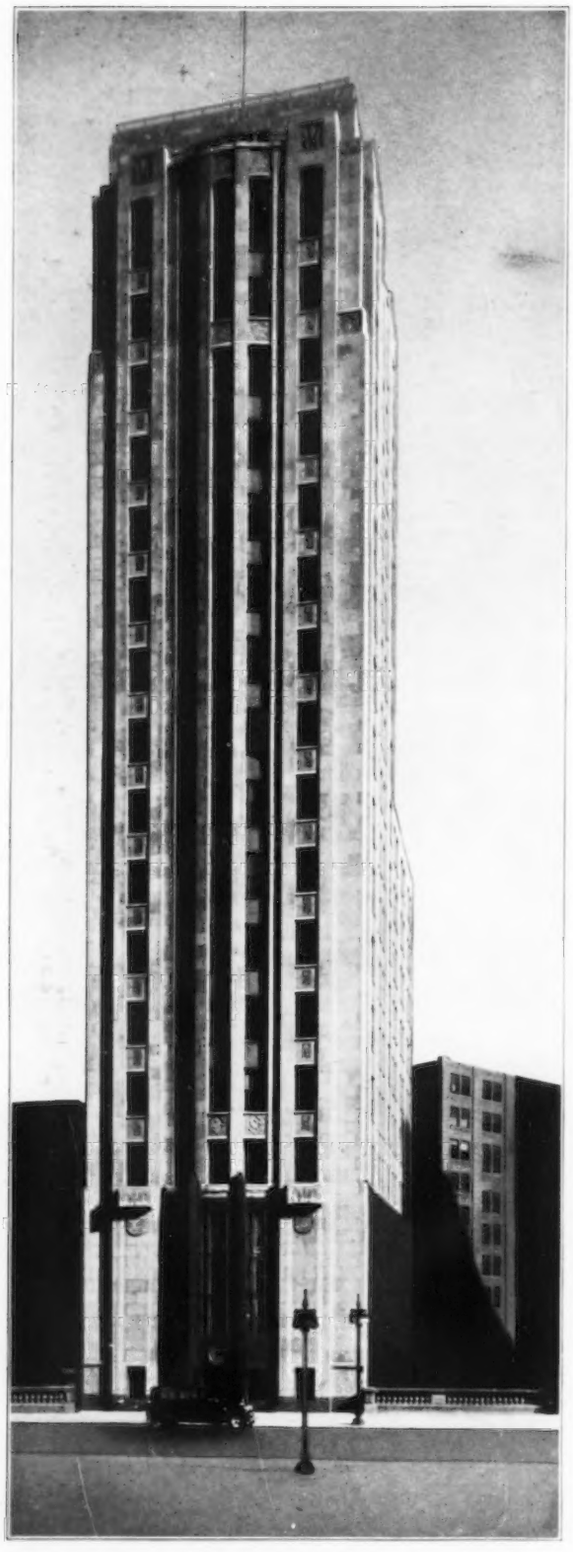
View of the door wide open. Note how the new YALE Concealed Door Closer permits the door to open the full 180 degrees—all the way back to wall.



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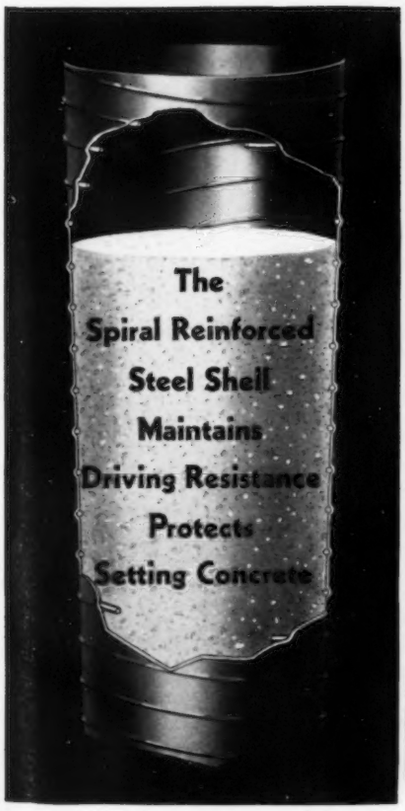

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Top: An attractive lobby; attractively lighted.

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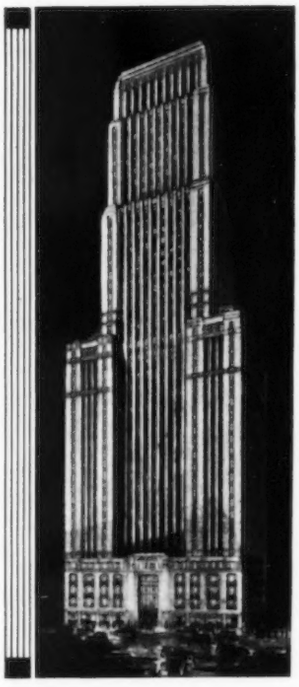

Adequate office illumination, for the present and for the future, is a prime attraction for tenants in the One La Salle Building.

ADEQUATE office illumination was used as a selling point by the renting agents in obtaining tenants for the new One La Salle Building in Chicago. And this advantage, which helped to fill the building to 90% of capacity in quick time, will remain an advantage for years to come, even though lighting standards advance rapidly. Reserve capacity has been provided which assures the building against quick electrical obsolescence.

In setting standards for present and probable future lighting requirements in this building, the co-operation of the Lighting Bureau of the local electric service company proved to be of great value. Here was found a knowledge of the trend toward increased use of electricity, together with a fund of experience concerning inadequate electric service in buildings now only a few years old. With this knowledge and experience as a basis, a practical and economical wiring and lighting installation was designed that triumphed over the architectural difficulties and accomplished the sought-for results.

There is an average installed lighting intensity throughout this building of more than two watts per square foot. In actual working areas, of course, this intensity is even higher. And for the future, when demands for lighting and electricity may be expected to reach a level higher than today, the wiring installation can carry double the electricity now used.

Building for permanence cannot tolerate a skimped or inflexible electrical installation. Buildings erected today must be adaptable to developments that are typified by the ever-increasing use of electricity.

For information about trends in lighting standards, and about adequate wiring, call on the Lighting Bureau of your local electric service company, or write direct

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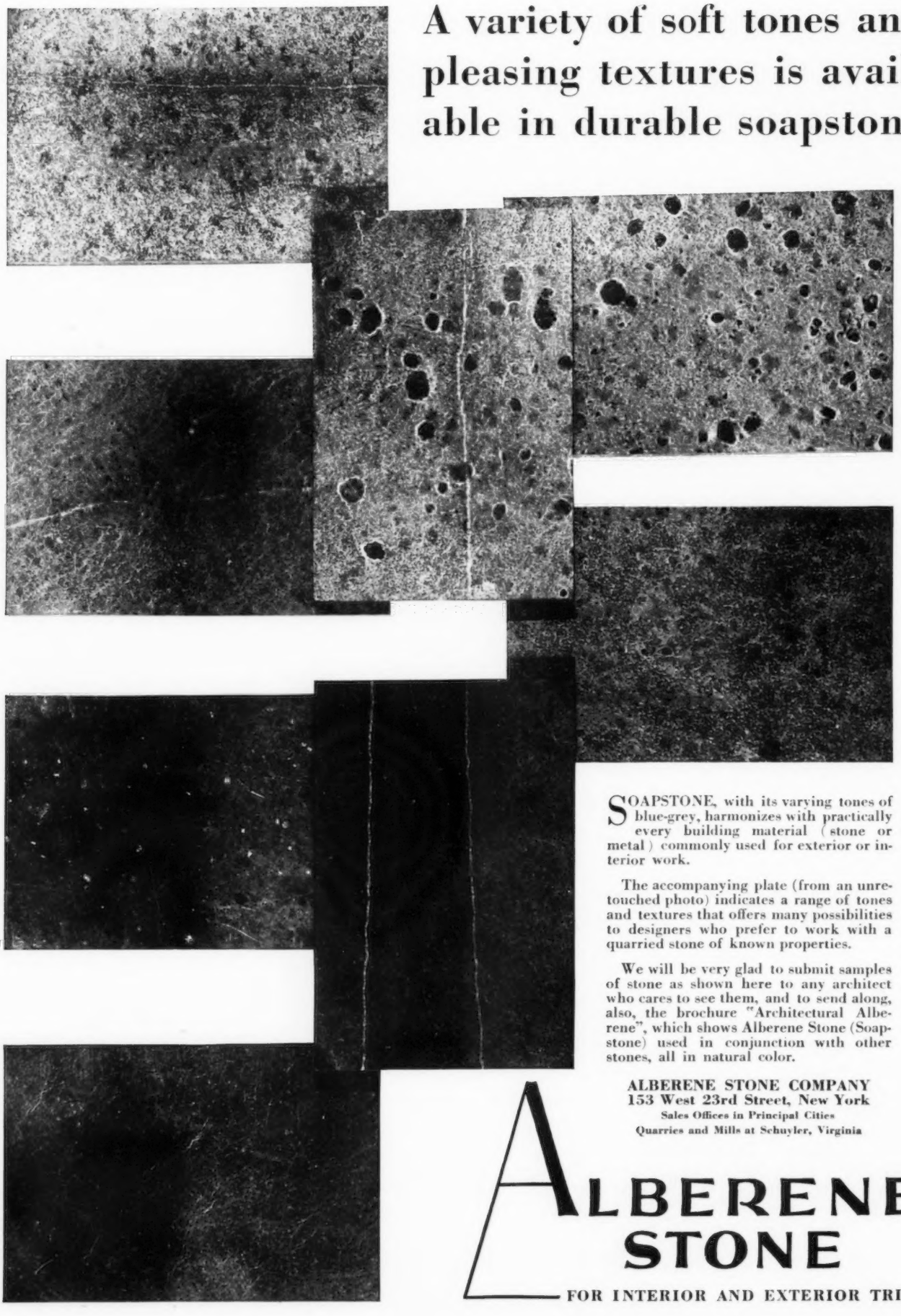

SOAPSTONE, with its varying tones of blue-grey, harmonizes with practically every building material (stone or metal) commonly used for exterior or interior work.

The accompanying plate (from an unretouched photo) indicates a range of tones and textures that offers many possibilities to designers who prefer to work with a quarried stone of known properties.

We will be very glad to submit samples of stone as shown here to any architect who cares to see them, and to send along, also, the brochure "Architectural Alberene", which shows Alberene Stone (Soapstone) used in conjunction with other stones, all in natural color.

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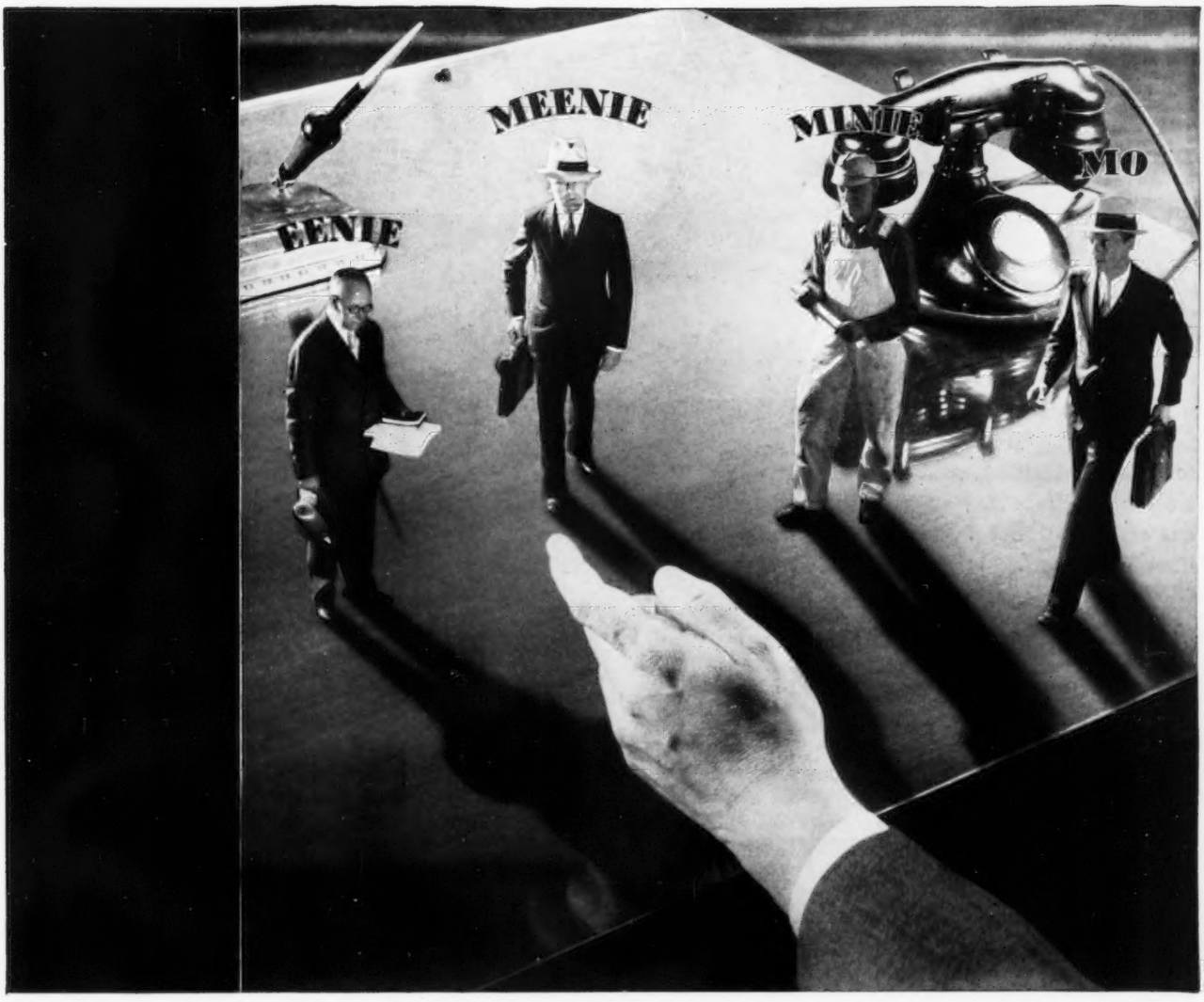


We know a better way!

"When you want a good floor, get a good man to lay it!" But how to find that man? One bidder points to his low price — another to his high recommendations. A third offers favorable terms for payment. A fourth "looks" dependable. How are you going to decide? Trust to a hunch . . . or toss a coin?

Why not rule out chance entirely? Write us for the name or names of the most expert floor contractors in your city or state. As the world's largest manufacturer of smooth-surface floorings, we make it our business to know the accomplishments and capability of leading floor contractors in all sections of the country.

The firms we recommend to you will be thoroughly versed in modern methods of resilient floor installation. They will lay for you at reasonable cost heavy-duty floors of Sealex Battleship Linoleum and Sealex Jaspé Linoleum which stand severe traffic for years. They are also skilled in the installation of special designed-to-order floors, utilizing such beautiful materials as Sealex Veltone and Sealex Treadlite Linoleum Tile.

Write us for the names of these firms—and for full information on our Bonded Floors installation service, in which Sealex materials are backed by a Guaranty Bond, issued by the U. S. Fidelity and Guaranty Co.

CONGOLEUM-NAIRN INC., KEARNY, N. J.

SEALEX
LINOLEUM FLOORS

Lighting the way of Learning
IN BALTIMORE

Well aware of the importance of efficient, glareless illumination in school work, educational authorities and designers of school buildings are particularly careful in their selection of lighting globes. It is a significant fact that many of the newer educational buildings are illuminated with Macbeth "Galax" Globes. The latest building to be so equipped is the attractive Administration Building of the Department of Education in Baltimore.

The perfection of light diffusion given by "Galax" Globes is readily apparent on examination. They are the only one-piece, homogeneous semi-indirect illuminating globes. They are made of a single piece of glass possessing dual opacity . . . the upper part transmitting efficiently, with a slight diffusion, the lower part reflecting, entirely without glare. Their low maintenance expense and economy of wattage are additional factors worthy of consideration . . . Complete information and photometric data furnished on request. MACBETH-EVANS GLASS CO., Charleroi, Pa.

Administration Bldg., Department of Education, Baltimore, Md. *Lucius R. White, Jr., Arch., H. J. Leimbach, Supervising Engineer*

Complete Catalog in SWEET'S

Macbeth
Galax Globes

District Offices: Philadelphia New York St. Louis Boston Pittsburgh Chicago

Houston Buffalo Toronto Indianapolis San Francisco Baltimore Detroit Cleveland

Revere Products *in* *America's Leading Universities*

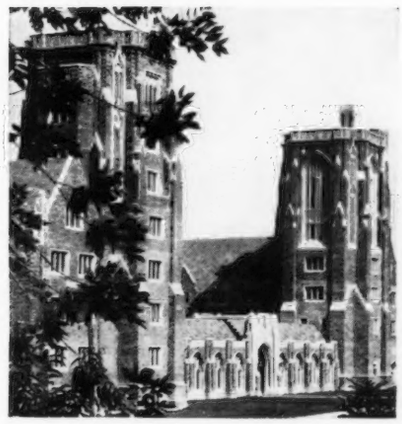
BUILT for the ages are America's institutions of Higher Learning. Generations of men and women, returning year after year, find their Alma Maters mellowed and enduring still.

Into the construction of these buildings have gone the finest, most lasting materials procurable. In exposed metal work and in piping, Revere has played a notable part.

Glance down the partial list of universities and colleges in which Revere Products have been used. Consider . . . from New York to Seattle and from Ithaca to Louisville . . . how many have chosen Revere.

Why such nation-wide preference? Four reasons stand out: (1) the enduring quality of copper and brass, the eternal metals (2) the high standards of manufacture which Revere has enforced since the days of Paul Revere himself (3) the real economy of real permanence, unburdened by need for repairs, replacements and attendant annoyances, and (4) the unfailing service of Revere Brass Pipe, the mellowed beauty of Revere Sheet Copper.

If you have plans on your boards for college and school buildings . . . Revere would welcome the opportunity of giving you further details. Not only of the products mentioned, but of others, such as Revere Leadtex, Revere Architectural Bronze and P R Pipe. The advantages of these Revere Products are worthy of your recognition.



Recently completed War Memorial Dormitories, Cornell University, Ithaca, N. Y. Architect: Charles Klauder, Philadelphia. Plumbing Contractor: Jameison, McKinney Co., Ithaca. Revere Brass Pipe used throughout for plumbing.

●

REVERE BRASS PIPE

CORNELL UNIVERSITY
War Memorial and Balch Hall
UNIVERSITY OF CINCINNATI
Library
UNIVERSITY OF LOUISVILLE
Administration Building
UNIVERSITY OF MICHIGAN
Hutchins Hall

REVERE SHEET COPPER

COLUMBIA UNIVERSITY
RADCLIFFE COLLEGE
WELLESLEY COLLEGE
Stone Hall
HARVARD UNIVERSITY
Schools of Business Administration
MASSACHUSETTS INSTITUTE OF TECHNOLOGY
UNITED STATES MILITARY ACADEMY
UNITED STATES NAVAL ACADEMY
UNIVERSITY OF WASHINGTON (Seattle)
Aeronautics Building

Revere Copper *and* Brass
INCORPORATED

Revere COPPER BRASS Products

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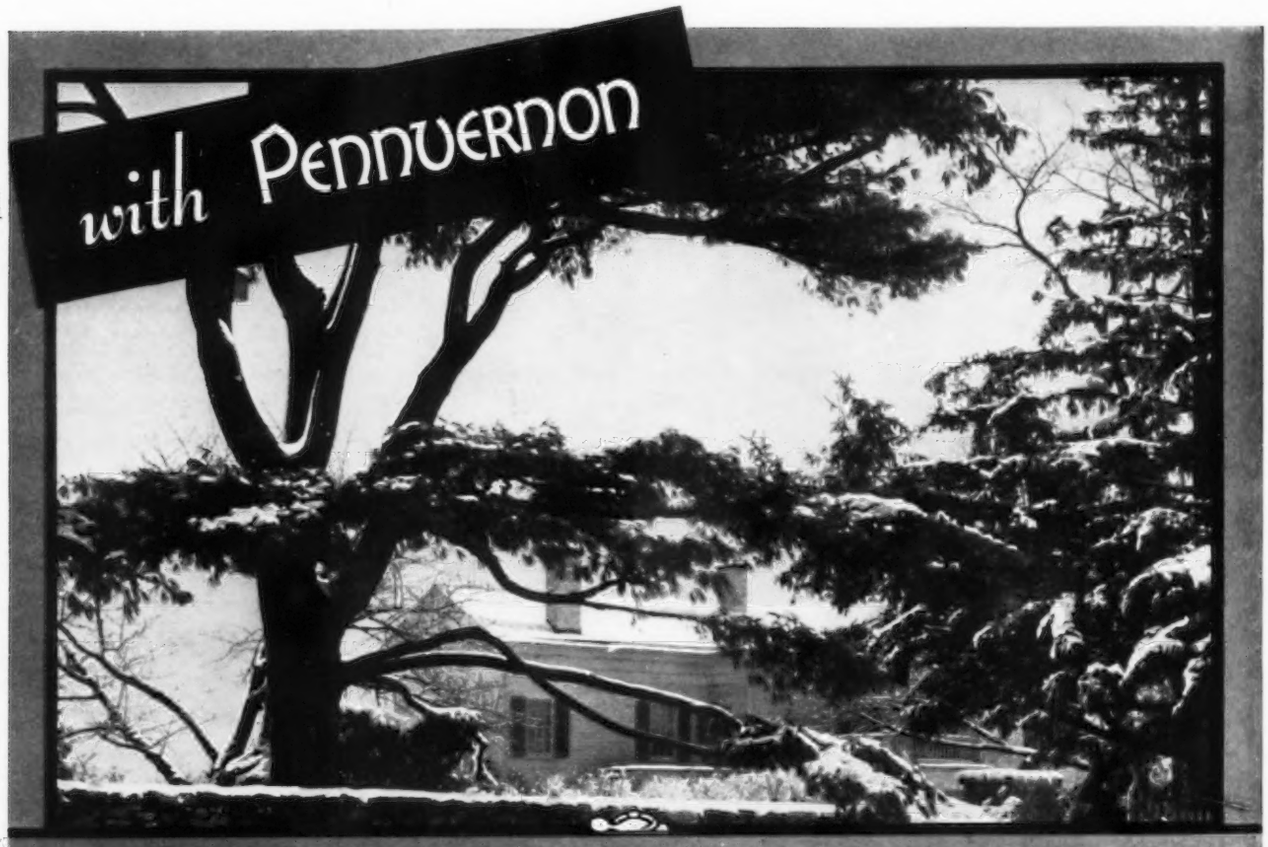
Dallas *Division, Chicago, Ill.* Taunton-New Bedford *Division, Taunton, Mass.* Rome *Division, Rome, N. Y.*

EXECUTIVE OFFICES: NEW YORK CITY
GENERAL OFFICES: ROME, N. Y.

Larger Windows mean *brighter* Homes



LARGER windows enable architects to build into the home the beauty of outside scenes—clear, attractive views that only the finest window glass can transmit faithfully and fully. They have discovered in Pennvernon Window Glass the outstanding qualities essential for brighter homes. Remarkable clearness and freedom from distortion are assured by the exclusive process of Pennvernon manufacture, which makes and keeps the glass perfectly flat throughout.

More than this, large windows glazed with Pennvernon Window Glass reflect the landscape so truly and so clearly that they greatly enhance the architectural beauty of the building. No marring of the design by noticeable distortion. Pennvernon's smooth, lustrous finish on both sides gives a lasting brilliance, which results in 100% better reflection.

We shall be glad to have you check for yourself the qualities of this finer glass. It is available at the warehouses of the Pittsburgh Plate Glass Company in every leading city, and through progressive glass jobbers. For samples and our booklet describing Pennvernon manufacture, address the Pittsburgh Plate Glass Company, Grant Building, Pittsburgh, Penna.

PENNVERNON
flat drawn
WINDOW GLASS

OUTSTANDING

CITY HALLS

WHOSE DOORS SWING ON

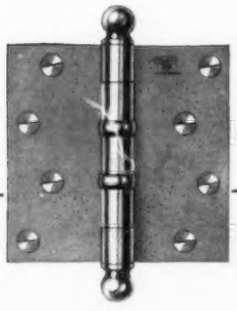
STANLEY BALL BEARING BUTTS

LOS ANGELES CITY HALL
Architects: John G. Austin, Albert C. Martin, John Parkinson, Associates

BUFFALO CITY HALL
Architects: Dietel and Wade. *Associate Architect:* Sullivan W. Jones

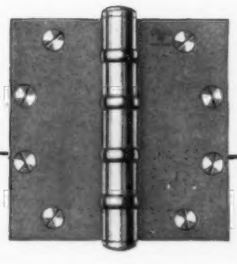
The distinctiveness of recent American City Halls is supported by the beauty and efficiency of modern materials and equipment.

The important requirement of smooth, trouble-free operation of the multitude of doors in these outstanding City Halls has been effectively met by the installation of Stanley Ball Bearing Butts.



THE STANLEY WORKS
New Britain, Conn.

STANLEY SW



STANLEY BALL-BEARING BUTTS

The Barber-Colman Electric System of Temperature Control

AN ACCURATE, GOOD-LOOKING THERMOSTAT

For use with three-wire, low-voltage temperature control equipment

HERE is an electric thermostat that is distinctive not only for its dependable and accurate control, but also for its good appearance. The softly brilliant moulded case and base enclose working parts which are designed to perform effectively the functions for which they are intended, and which are rust-proofed before assembly to assure long life and dependable service. A number of models of the Room Thermostat shown in the illustration are available, being made with or without the thermometer on the case, with or without special cover screws, with or without detents to meet special conditions, and with either internal or external adjustment. These thermostats will actuate the controlled equipment on a temperature variation at the thermostat of 1° or less above or below the set point. Other models of Barber-Colman Room Thermostats having the same characteristics of good looks and accurate control as the above are as follows: Two-Temperature Thermostats, Duplex Thermostats, and Compound Thermostats. Barber-Colman instruments may be used in connection with any type of heating, ventilating or air-conditioning systems, and also for individual units of heating or ventilating equipment. You will be surprised at the low prices at which these good-looking and dependable control instruments can be obtained.

A 48-page catalog describing the Barber-Colman Electric System of Temperature Control will be mailed upon request. Write for your copy today.

BARBER-COLMAN COMPANY
ROCKFORD, ILLINOIS, U. S. A.

The first successful ELECTRIC SYSTEM of Room Temperature Control

CHRYSLER CHOOSES
a style background for smart cars

Smart cars, displayed on a smart background! The International Showroom of the Chrysler Motor Company in the famed Chrysler Building, New York City. The floor shown is Armstrong's Embossed Inlaid Linoleum No. 6180.

AND that background, of course, is Armstrong's Linoleum. In smart showrooms from coast to coast you'll find these modern floors. They *do* help sales—a fact proven by the actual experience of merchants, manufacturers, and dealers who have them.

If you draw up plans for stores and showrooms, be sure you have complete information about Armstrong's Floors. Do you know, for instance, that there are more than three hundred designs to choose from? That any design you may conceive can be faithfully created in Armstrong's Linoleum? That these floors can be laid quickly, without interrupting business? That they outwear ordinary wood floors, and keep their trim appearance for years?

Another floor in the Chrysler showroom. A white Marble Inlaid background (Design No. 13131) set off by a black marbleized border. Stair risers and treads, too, are linoleum.

Our file size specification book and our section in Sweet's will tell you all this and more. Our color-illustrated book "Public Floors of Enduring Beauty" shows a variety of installations. Both books are yours for the asking. Just address Service Bureau for Architects, Armstrong Cork Company, Lancaster, Pa.

Armstrong's (A) Product

How Armstrong's Floors Save Your Clients' Money

MODERATE FIRST COST . . . INEXPENSIVE INSTALLATION . . . LOW UPKEEP COST . . . LONG WEAR . . . COLOR AND DESIGN WITHOUT INCREASED EXPENSE . . . NO REFINISHING . . . ECONOMICAL FOR REMODELING JOBS!

Armstrong's Linoleum Floors

FOR EVERY ROOM IN THE HOUSE

PLAIN · INLAID · EMBOSSED · JASPÉ · LINOFLOR · LINOTILE · CORK TILE · ASPHALT TILE

Depression lends perspective

Pocket books may not fatten on depression, but judgment and experience can. Those who have the eyes to see and the minds to interpret can draw many lessons from the perspective of fat and lean years that range themselves behind us.

In building, none is more apparent or better worth thought than this: the structures that have been the worst hit by slack times, whose realty values have fallen, whose security values interest no banker, and whose tenants have fled are those which were poorly planned, cheaply built.

Conversely, buildings planned by competent architects, constructed of carefully selected materials still show a respectable tenant roster, still can raise money on the mortgage market, and still have substantial appraisal values.

The moral is as salutary as it is obvious.

Valves CRANE *Fittings*

CRANE CO., GENERAL OFFICES: 836 S. MICHIGAN AVE., CHICAGO

NEW YORK : 23 WEST 44TH STREET

Branches and Sales Offices in One Hundred and Ninety Cities

MOTLEY

Some buildings, and they are with convincing regularity those whose dividends disappoint the promoters, show a motley make-up . . . a lack of harmony . . . an absence of central plan.

The successful builder, on the other hand, leaves motley where it belongs, on the fool's back. He avoids it by a very simple expedient. He trusts his architect's judgment. He realizes that the man whose trained imagination conceived the building, and whose experience directed its construction is alone capable of finishing it. He allows none to destroy a harmonious and honest plan by interfering with his architect's specifications.

Valves CRANE *Fittings*

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Dedicated to earn just recognition for Architects

The two ads reprinted here are dedicated to carrying on the campaign which Crane Co. has always fought; the gaining for architects of just recognition on the part of both home and speculative builders. They are part of a series sponsored by Crane Co., published in magazines that circulate nationally in the building investment and management field where the architect is too often hampered by the interference of others.

CRANE CO., GENERAL OFFICES: 836 S. MICHIGAN AVE., CHICAGO

NEW YORK: 23 W. 44TH STREET

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VALVES FITTINGS

Yes, it has a Bottom
Also Another End

But there seems to be NO end to the supply of slate which this quarry holds in store for you. It is the largest in the Vermont slate region producing unfading mottled greens and purples, in a wide range of beautiful color effects.

To visit a Sheldon Quarry is to receive the impression which suggested the phrase "The Stone of Eternal Beauty"—for roofing and all sorts of structural purposes. Indeed, to specify Sheldon's Colored Slates is to give your Client the incomparable in beauty and in permanence.

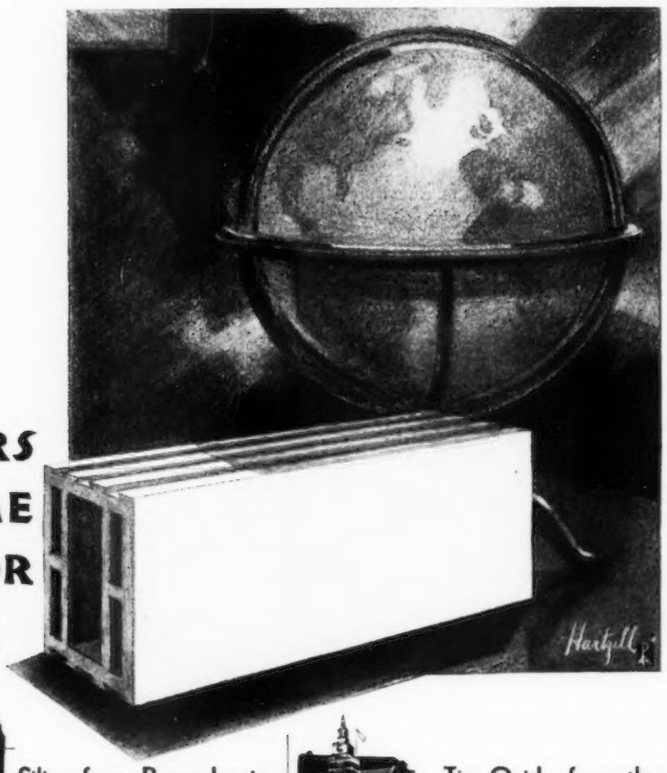
We are constantly being told by Customers of wide experience that our shipments represent greater value for the money than they expected or ever received from other sources—demonstrating that there is no "or equal" to Sheldon's Slates.

F.C. SHELDON SLATE CO.

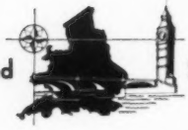
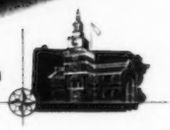
GENERAL OFFICES · GRANVILLE · N.Y.

• BRANCHES IN PRINCIPAL CITIES •

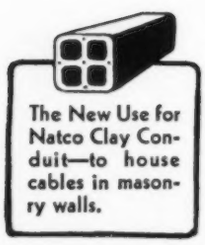
THE PRESENT DOLLAR MEASURES THE COST - THE FUTURE DOLLAR THE PROFIT



From
THE FOUR CORNERS OF THE EARTH COME RAW MATERIALS FOR *Natco* VITRITILE

Ball and China clays from England  Silica from Pennsylvania  Tin Oxide from the Malay Archipelago Antimony Oxide from China Alumina from Greenland Strontium Carbonate from Germany Gum Arabic from Africa Calcium Carbonate from the Chalk Cliffs of England Manganese Dioxide from the Caucasus Mountains Cobalt Oxide from the Belgian Congo Nickel Oxide from New Caledonia and Gum Tragacanth from Asia Minor. The world unites in providing the raw materials that, skilfully and scientifically utilized, confer on Natco Vitritile its permanence and beauty.

Natco Vitritile offers charming shades that meet artistic needs a comprehensive line of shapes that meet structural needs. Send for a catalogue . . . or turn to Sweet's, A-549-602



The New Use for Natco Clay Conduit—to house cables in masonry walls.

NATCO
THE *COMPLETE* LINE *of* STRUCTURAL CLAY TILE

NATIONAL FIREPROOFING CORPORATION

General Offices: Fulton Bldg., Pittsburgh, Pa. Branch Offices: New York, Chanin Bldg.; Chicago, Builders Bldg.; Philadelphia, Architects Bldg.; Boston, Textile Bldg.; Washington, D.C., National Press Bldg., Birmingham, Ala., Martin Bldg. In Canada: National Fire Proofing Company, of Canada, Ltd., Toronto, Ont.

The largest concern in the world manufacturing a complete line of Structural Clay Tile and Underground Clay Conduit.

Harborview Hospital, Seattle, Washington, is one of the largest and finest hospitals on the Pacific Coast. Architects: Thomas, Grainger & Thomas. Medical Consultant: William Henry Walsh, M. D., Chicago. General Contractor: Western Construction Co.

FOOD SERVICE EQUIPMENT *will "look better longer"* IN NEW HARBORVIEW HOSPITAL, SEATTLE

Look better and *last longer* because it's made of lustrous, wear-resisting Monel Metal! The nurses' cafeteria and diet kitchens throughout this splendid 1000-bed hospital are completely Monel Metal equipped.

These units will remain bright and sanitary... will always be easy to clean and keep clean, because Monel Metal is rust-proof and highly resistant to corrosion. Its ready cleanability makes Monel Metal the ideal material for food service installations where cleaning costs are an important factor in maintenance.

Monel Metal likewise lowers repair and replacement expense because it is a high Nickel alloy with the strength of steel. It withstands the hard knocks and heavy impacts encountered in severe hospital service. Since it is solid clear through, it has no coating to chip, crack or wear off. It never grows dull or shoddy looking, but always retains its bright, cheerful appearance.

Write for new booklet which describes in detail the plan and operation of food service, laundry, clinical and surgical departments of another Monel Metal job... Christ Hospital, Cincinnati, Ohio.

A HIGH NICKEL ALLOY

MONEL METAL

NICKEL ALLOYS LOOK BETTER LONGER

INCO MONEL METAL

View of the nurses' cafeteria, showing Monel Metal food service equipment installed by Brewer & Cone, Inc., Seattle, Washington. The hospital diet kitchens also contain Monel Metal equipment.

THE INTERNATIONAL NICKEL COMPANY, INC.

67 Wall Street **New York, N. Y.**

Monel Metal is a registered trade mark applied to a technically controlled nickel-copper alloy of high nickel content. Monel Metal is mined, smelted, refined, rolled and marketed solely by International Nickel.

CITY HOTEL, BUENOS AIRES, ARGENTINE

With the Moderns of the Argentine

WHEREVER there is evidence of advanced thought in architecture and building construction there is evidence of Bryant popularity, for in the finest buildings of the world, where design and efficiency are paramount considerations, Bryant Superior Wiring Devices will be found installed.

A typical example is this new deluxe City Hotel recently completed in Buenos Aires, Argentine. Over 4,500 Bryant Devices are installed in this most modern of South American hotels, located in the most modern of South American cities.

Leading architects, engineers and contractors standardize on Bryant, because Bryant makes good devices. This reputation is based on past accomplishments. Its maintenance depends entirely on present performances; the high standard will be maintained.

BRYANT
SUPERIOR WIRING DEVICES

BRYANT
SUPERIOR WIRING DEVICES

Manufactured by
THE BRYANT ELECTRIC CO., BRIDGEPORT, CONN.

A1231

MANUFACTURERS OF "SUPERIOR WIRING DEVICES" SINCE 1888-MANUFACTURERS OF HEMCO PRODUCTS

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PROTECTING PUBLIC BUILDINGS

A.D.T. SYSTEM

IN HARTFORD

When architects design public buildings—structures that house highly valuable property and personnel—they usually specify A. D. T. Protection Services.

The New State Office Building in Hartford is typical. On every floor you will find A. D. T. Night Watchman's Supervisory and Fire Alarm Stations that are connected direct to the A. D. T. Central Station. A. D. T. Fire Alarm Gongs also are installed throughout the building.

Every hour of the day and night—week days—Sundays—holidays—A. D. T. Central Station operators are in constant touch with the building—ready to despatch emergency assistance or relay a fire alarm signal without a moment's delay.

The Connecticut State Capitol, the State Library, and the Hartford City Hall, also are A. D. T. Protected . . . as are the majority of the larger buildings of this type throughout the country.

Specifications in Sweets. Bulletins on request. There are A. D. T. offices in 117 cities in the United States.

Connecticut State Office Building
Smith & Bassette, Architects

Landmarks of Modern Protection

Controlled Companies of

American District Telegraph Company

155 Sixth Avenue, New York, N. Y.

1397

HEAVY DUTY INDUSTRIAL BUILDINGS

THE BUILDINGS illustrated above are apt examples of the satisfactory use of structural steel fabricated to meet severe operating conditions. Strength, adaptability and durability commends structural steel for the frame and other essential members of

BRIDGES · BUILDINGS · BARGES · TOWERS

We have modern facilities for manufacturing steel structures of all classes.
Inquiries will receive prompt attention.

AMERICAN BRIDGE COMPANY

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General Offices: Frick Building, Pittsburgh, Pa.

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Hudson Terminal Bldg.
30 Church St.—New York, N. Y.

Up and down . . . up and down . . . . down

thousands of times rolls this Window Shade!

AND since it's a Tontine Shade, it'll stand it and come back for more. For Tontine Shades have toughness, flexibility and unusual tensile strength.

They're washable too. When they get soiled, have them scrubbed. With just plain ordinary soap and water. They'll come out looking fresh as new again. For scrubbing but renews their bright finish and beauty. Think how much money in replacements that fact alone saves you.

Tontine Shades are impregnated with pyroxylin, the same basic substance used in the famous Duco finishes for cars and furniture. That's why Tontine Shades are so sturdy. Why they never crack, fray, or pinhole. Why they are washable. Why they last for years and look well to the very end.

Hundreds of large buildings the country over are equipped with Tontine Shades. Because they have proved so resistant to wear. Because they're kept clean so easily. For complete window shade satisfaction have your TONTINE shades mounted on TONTINE Rollers.

Let us send you samples of Tontine Shades. Your name on the coupon below will bring samples to you by return mail.

MILWAUKEE COUNTY COURTHOUSE

Milwaukee, Wis.

There are 777 window shades in this new building—all of them du Pont Tontine Shades. In the ten years to come they'll be rolled up and down thousands of times. They'll stand sun and rain and wind. And they'll come through in first-rate condition.

DU PONT TONTINE

REG. U. S. PAT. OFF. REG. U. S. PAT. OFF.

(PRONOUNCED TON-TEEN)

THE *WASHABLE* WINDOW SHADE

E. I. DU PONT DE NEMOURS & CO., INC.
Desk A. R. 4, Newburgh, N. Y. A.R. 7

Please send me samples of, and complete information about, Tontine Washable Window Shades.

Name_____

Address_____

Canadian subscribers address: Canadian Industries Limited, Fabrikoid Division, New Toronto, Ont., Can.

Consult the Classified Business Directory of your telephone book for the authorized TONTINE *dealer in your city, selected for his reliability*

TESTED!

in the making by internally applied hydraulic pressure . . .

THERMOFLEX TRAPS

HANGERS

FITTINGS

Pipe fittings, cast and malleable, perfectly threaded, accurately machined and rigidly inspected. Pipe hangers adjustable after the pipe is up. Reduce installation costs and maintenance expense.

THERMOFLEX TRAPS

AUTOMATIC SPRINKLERS

The famous Quartz bulbsprinklerhead. In most cases sprinklers will reduce insurance expense from 50 to 90 percent.

Where air dryness adversely affects processes, large savings are made by our humidification equipment.

HUMIDIFIERS

THERMOFLEX TRAPS

will outlast the units on which they are used!

THE Hydron Bellows, the heart of every Thermoflex Trap, would be destroyed in the making if any weaknesses whatever existed in its structure. It is formed from a tube, by tremendous hydraulic pressure internally applied—pressure greater by far than the bellows will ever meet with in use. So, if there were any weaknesses in the tube or the end fitting, the bellows would then and there be destroyed.

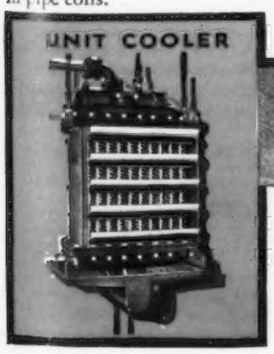
That is why leading engineers can say that each and every Thermoflex Trap is "immortal". It will open and close millions of times—outlasting the radiator, and even the building itself.

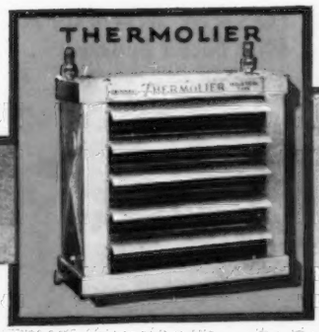
The Hydron Bellows is in all Thermoflex radiator traps, drip traps, offset traps and high pressure traps. Look in Sweet's Catalogues, or write for information to Grinnell Company, Inc. Our sales engineers will work with you to insure permanent satisfaction.

GRINNELL COMPANY INC.

Executive Offices: Providence, R. I. ***Branches in all principal cities***

A revolutionary improvement in refrigeration. It replaces more than ten times its weight in pipe coils.





This remarkable Unit Heater is a better and cheaper means of heating industrial and commercial buildings. Heating systems can usually be modernized almost over-night, with a tremendous saving on fuel.

Pipe fabrication, lap joints, pipe bends, forged hangers and welded headers comprise the Triple XXX line for Super Power work. By modernizing to use high temperature steam your yearly savings will often run to five or six figures.

Outside view of the Josam-Marsh Grease Interceptor showing its neat and compact appearance

ADEQUATE GREASE INTERCEPTION
for the Modern Kitchen . .

GREASE
INLET
OUTLET
Josam Marsh
GREASE INTERCEPTOR
(a) Inlet. (b) V-Baffle. (c) Flat Baffle. (d) Converging Bottom Ribs. (e) Converging Side Wall Ribs. (f) Outlet. (g) Channel to Outlet. (h) Outlet Pipe Connection. (i) Vent Connection and Cleanout. (j) Seal Wall Separating Outlet and Body of Interceptor.
INLET
OUTLET

The Josam-Marsh Grease Interceptor in Action

Inside view of the Josam-Marsh Grease Interceptor with the Component parts identified

IT is no longer true that architects and engineers, in planning the modern kitchen, despair of being able to meet every possible situation or emergency that is likely to develop in the operation of a kitchen. The one thing in question for a long time was adequate interception of grease. Grease has always been a bothersome element in the operation of the modern plumbing system.

A thoroughly tested and proved device has been gradually and quietly establishing the fact that adequate grease interception is dependent upon the method by which the grease is intercepted. This device is the Josam-Marsh Grease Interceptor, now recognized by hundreds of architects and engineers because of its unique principle of operation and adaptability under the most unusual conditions. The new standards of grease interception it has established are founded on these five points:

No water jacket is used to solidify the grease.

Regardless of waste water temperature, Josam-Marsh Grease Interceptors, when properly installed, remove ninety-eight per cent of the grease.

Retains only clean, salable grease. Evacuates all solids.

Josam-Marsh Grease Interceptors have no moving parts—nothing to wear out. They are easily installed.

Cost installed is lower. No cold water connections necessary.

Josam-Marsh Grease Interceptors are made in sizes to fit every grease intercepting requirement from an apartment house sink to the largest hotel kitchen unit. Also made for industrial use.

The Josam representative in your vicinity is fully qualified and equipped to aid you in the solution of grease interception problems which may arise in planning kitchens for hotels, clubs, apartment houses and homes. A demonstration kit enables him to prove valuable data on the interception of grease. Write for special portfolio on this subject, also Catalog "G" and New Products Supplement.

JOSAM MANUFACTURING CO.

4908 Euclid Building . . Cleveland, Ohio

FACTORY: MICHIGAN CITY, INDIANA

BRANCHES IN ALL PRINCIPAL CITIES

Manufactured and sold in Canada by Empire Brass Mfg. Co., Ltd., London, Ont. Branches throughout the Dominion.

JOSAM PRODUCTS ARE SOLD BY ALL PLUMBING AND HEATING SUPPLY WHOLESALERS

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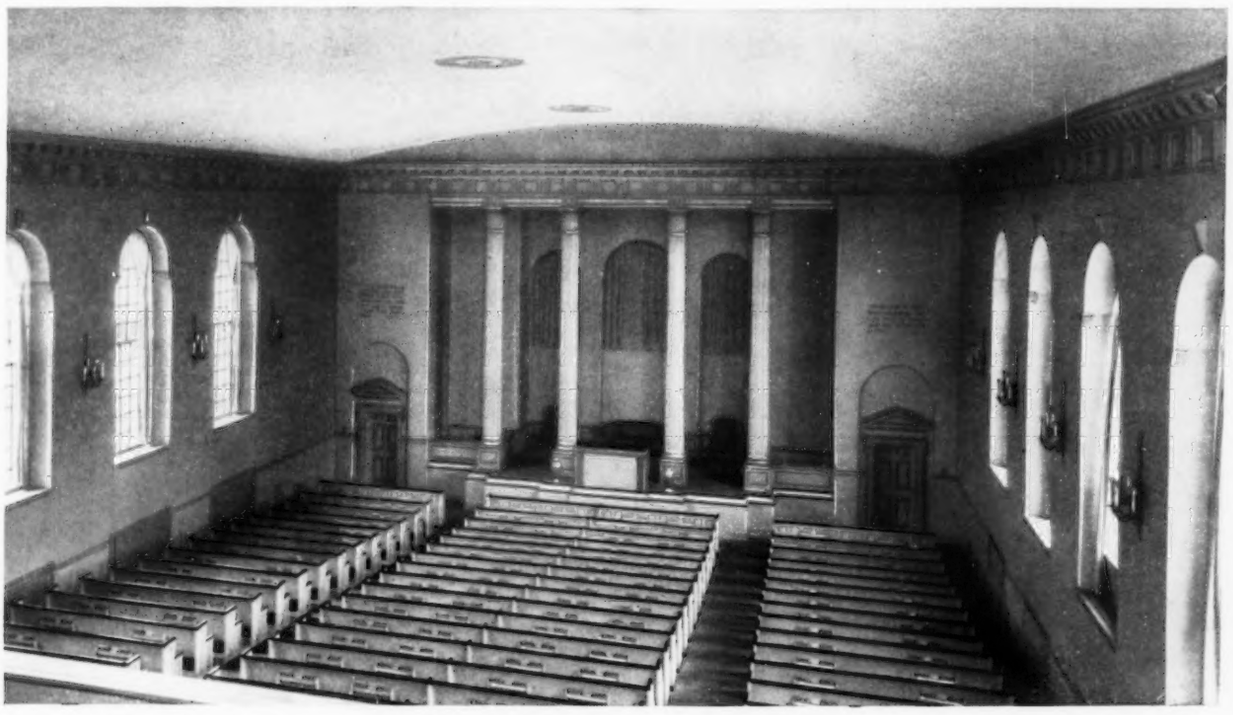
SWEETS

We will welcome inquiries regarding the use and installation of the Josam Products listed below: Josam Drains for Floors, Roofs, Showers, Urinals, Garages and Hospitals; New Josam Non-Clog Triple Drainage Drains; Josam Swimming Pool Equipment; Josam-Marsh Grease, Plaster, Dental and Surgical, Sediment and Hair Interceptors; Josam-Marsh Shock Absorbers for pipe lines; Josam Open Seat Swing Check Valves; Josam Open Seat Back Water Sewer Valves; Josam Adjustable Closet Outlet Connections and Bends, Water and Gas-Tight



Sabinite Acoustical Plaster on ceiling, First Church of Christ, Scientist, Montclair, N. J. Faulkner & Wands, Architects.

Now—Perfect acoustics at low cost

with this new Sabinite Plaster

Improvements bring new advantages of interest to every Architect

WHEREVER perfect hearing conditions are desirable . . . in auditoriums, theatres, churches. . . architects find Sabinite, USG Acoustical Plaster, the low cost acoustical treatment. Now improvements in the new product called "Sabinite A" make it more economical, more effective than ever.

The sound-absorbing efficiency of the new Sabinite has been increased. Its covering capacity has been further extended and its working qualities greatly improved.

Greater latitude is now permitted in the treatment of the finish coat of Sabinite. It is equally efficient when applied in a "trowel," "floated" or "broomed" finish. Sabinite is supplied in white and four standard colors—ecru, ivory, cream and buff. Other colors are prepared as desired.

Sabinite controls reverberation through direct absorption in any type of audience room where a plaster finish is suitable. Or it may be used in business quarters of all kinds, restaurants, hospitals, schools, etc., to reduce disturbing noises. It is fireproof, durable, and completely sanitary.

Plastering contractors apply Sabinite during construction of the building. To forestall the possibility of misapplication, a USG Service Man is supplied to supervise every Sabinite job. For further information please write for the new booklet pictured above or for booklet describing the complete USG Sound Control Service. United States Gypsum Company, Dept. 4312, 300 W. Adams St., Chicago. In Canada: Dominion Gypsum Co., Ltd., Toronto, Ontario.

SEND FOR FREE BOOKLET

Without charge we will send you this booklet describing the advantages of Sabinite Acoustical Plaster. It includes illustrations and data on many of the successful Sabinite installations.

U S

S A B I N I T E

THE USG ACOUSTICAL PLASTER

In Sweet's Catalogues

Carey Master Specifications

for

Built-up-Roof Construction

Carey 12 Master Built-Up Specifications include every type of roof construction—i.e.—asphalt—tar—asbestos—surfaced with slag, gravel, mineral or asphalt.

Specifications for each type include definite recommendations on service adaptability. The complete listing will be found in the 1932 edition of Sweet's Architectural Catalogues, Volume A, pages A-677 to A-701, inclusive.

THE PHILIP CAREY COMPANY
Lockland, Cincinnati, Ohio
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BUILT-UP ROOFS
ASPHALT PRODUCTS
ELASTITE EXPANSION JOINT
WATERPROOFINGS
ROOF PAINTS

Carey PRODUCTS EST. 1873

HEAT INSULATIONS
ASBESTOS MATERIALS
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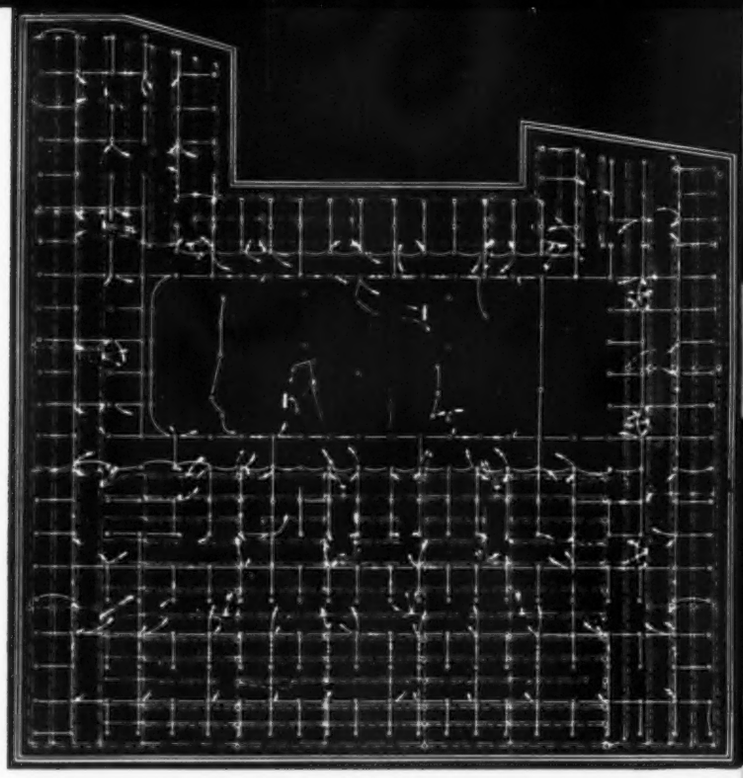
ASFALTSLATE SHINGLES
BUILDING PAPERS

A network of hidden wireways to meet every outlet need



HIDDEN wireways, beneath the floor, carrying wires to practically every point, will meet the electric outlet demands of every building. Today—tomorrow—years hence, outlets can be located as desired,—neatly, quickly and economically.

Whether your building is large or small, you cannot afford to be without underfloor duct. Tenants are demanding it, leading architects and engineers are specifying it.

For maximum wiring flexibility, specify underfloor duct.

Specify UNDERFLOOR DUCT

1519

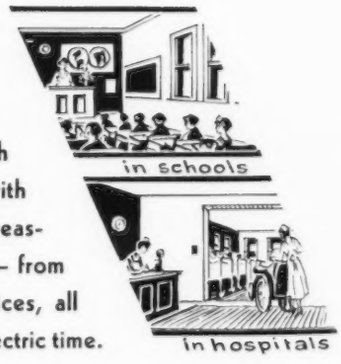
H&H *Timed to the Need!*

ELECTRIC Clock Hanger Outlet

DOUBLE SERVICE DEVICE
Mechanical support
For the clock, and
electrical connection

Plug Cap goes Flush with plate

This device gets rid of unsightly cord connections running from clocks to the nearest receptacles. At the same time it gives firm support to the clock. . . Receptacle part is recessed, so plug cap is sunk flush with wall. This allows clock to hang flat over the outlet with wire connection and receptacle wholly concealed. . . Increasing use of electric clocks makes this new hanger TIMELY — from now on *necessary* in up-to-date plans. Specify it for offices, all modern residences, schools, hospitals and institutions favoring electric time.



HART & HEGEMAN DIVISION

THE ARROW-HART & HEGEMAN ELECTRIC CO.
HARTFORD, CONN. MAKERS OF ELECTRIC SWITCHES SINCE 1890

Built for Permanence

New City Hall, Woburn, Massachusetts,
M. A. Dyer Company, Architects, Boston

*REINFORCED: In selecting a Stedman Floor, you secure all the recognized advantages of rubber flooring intensified by the exclusive Stedman method of reinforcement and manufactured by a company which makes only this single product and in one quality only—the best that it is possible to produce.

A public building is a public trust, which must be built for permanence. Thus was built this new City Hall at Woburn, Massachusetts. The time and style of its design, as fresh and vigorous as though created yesterday, are carried out by modern methods of construction and modern materials, surpassing the old standards of endurance and setting new standards of comfort and convenience.

The modern flooring material, Stedman Reinforced* Rubber, conforms to these high standards. It will last for years; for years it will hold its beauty, for years the grateful resilience of its surface will welcome the footstep.

When you build for years to come, build floors of Stedman Reinforced Rubber Tile—modern today, modern for the future. Send for our architectural catalogue with charts in color.

STEDMAN RUBBER FLOORING COMPANY
South Braintree - - - Massachusetts

Stedman Reinforced* Rubber Tile

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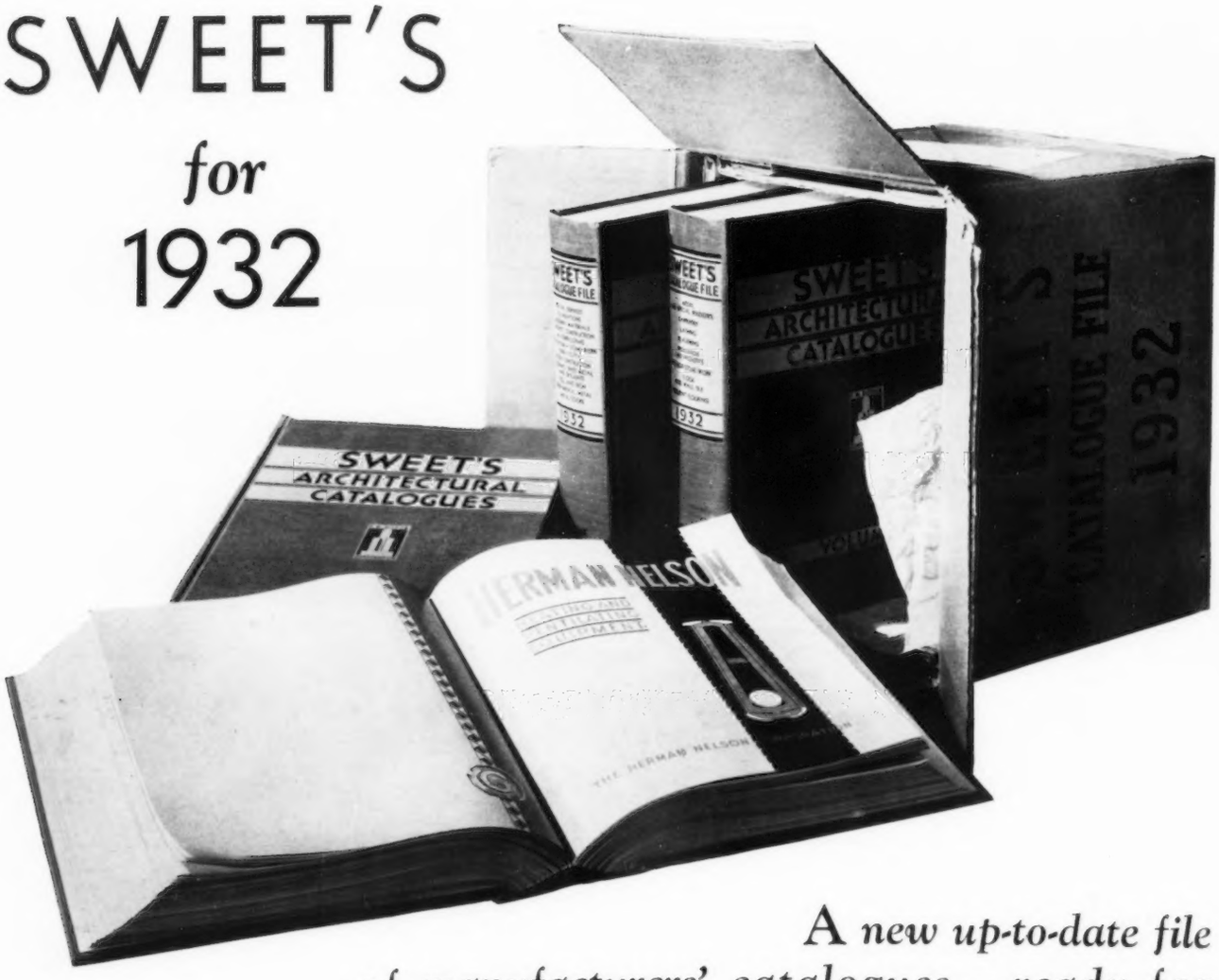

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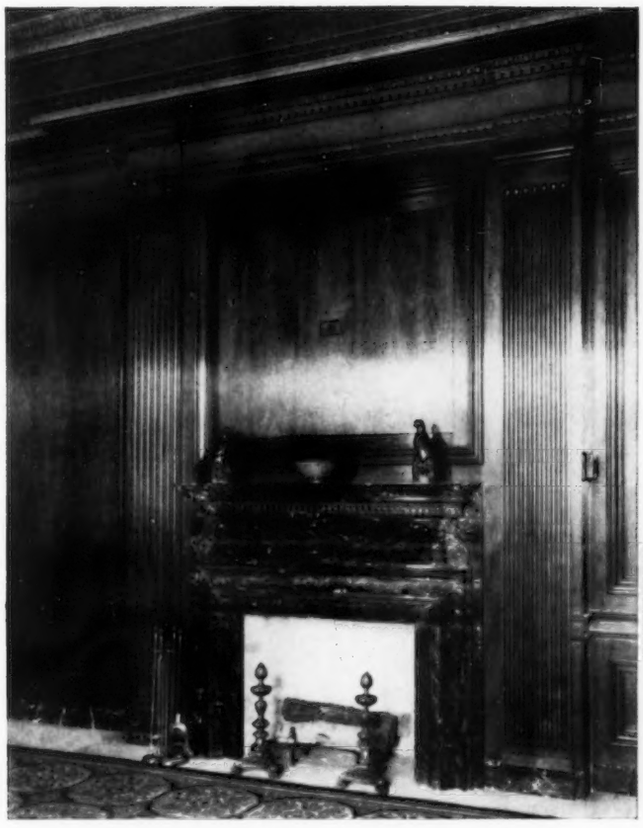

Fireplace detail—The Ohio Bell Telephone Building, Cleveland, Ohio, wired in Youngstown Buckeye Conduit by Hatzel & Buehler, Electrical Contractors—Architects Hubbel & Benes

INTERIOR *Beauty...* INBUILT *Endurance*

IN THE Ohio Bell Telephone Building, Cleveland, Ohio, the beauty of architectural details is matched by the permanence which has been built into that unseen but important element, the electrical systems, by the installation of Youngstown Buckeye Conduit.

Architects the country over, recognizing the outstanding features of Youngstown Buckeye Conduit, Youngstown Steel Pipe and Youngstown Sheets, specify accordingly.

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GALVANIZED SHEETS PROTECT ◆ ◆ ◆ ◆ SAVE WITH STEEL

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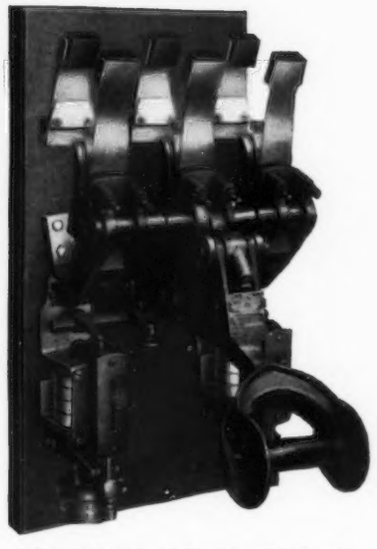

Type CP-108 triple-pole air circuit breaker with two overcurrent inverse-time devices

ON GUARD!

ELECTRICITY, guided along a complex system of unseen wires, provides unobtrusive but ever present comforts and conveniences in the Hotel Pierre, which rises 41 stories above Fifth Avenue, New York. More than 150 miles of wires reach from the main switchboard to distribution centers on each floor. G-E air circuit breakers stand guard day and night on the main power and light feeders in the Hotel Pierre.

General Electric air circuit breakers are built for all required voltage and ampere capacities either a-c. or d-c. They are trip-free, electrically and manually operated, and are made in single-pole and multipole combinations for instantaneous operation, and time delay on overcurrent.

Operating within 20-degree-temperature-rise requirements, these breakers protect circuits against overcurrent, reverse current, and undervoltage, as conditions may require.

490-11

GENERAL ELECTRIC

SALES AND ENGINEERING SERVICE IN PRINCIPAL CITIES

And after 25 years Georgia Marble chosen again by the Girard Trust Company, Philadelphia

In the foreground the familiar *Girard Trust*, built a quarter of a century ago of Georgia Marble . . . just beyond, the new 30-story, all Georgia Marble, Girard Trust Company Building. The new building was completed and occupied November 2, 1931, less than one year after the marble contract was let. McKim, Mead & White are the architects for both buildings, and United Engineers & Constructors, Inc., the builders of the one just completed.

OVER twenty-five years ago the officers of the Girard Trust Company and their architects, McKim, Mead & White agreed upon Georgia Marble as the best material for their bank building . . . And last year when the exterior material for their new 30-story building was under consideration the officers of the Girard Trust Company and their architects McKim, Mead & White again agreed upon Georgia Marble as the best material . . . This helps to substantiate our contention, that the clients and architects who know the most about Georgia Marble are the ones most likely to prefer it.

THE
GEORGIA MARBLE COMPANY
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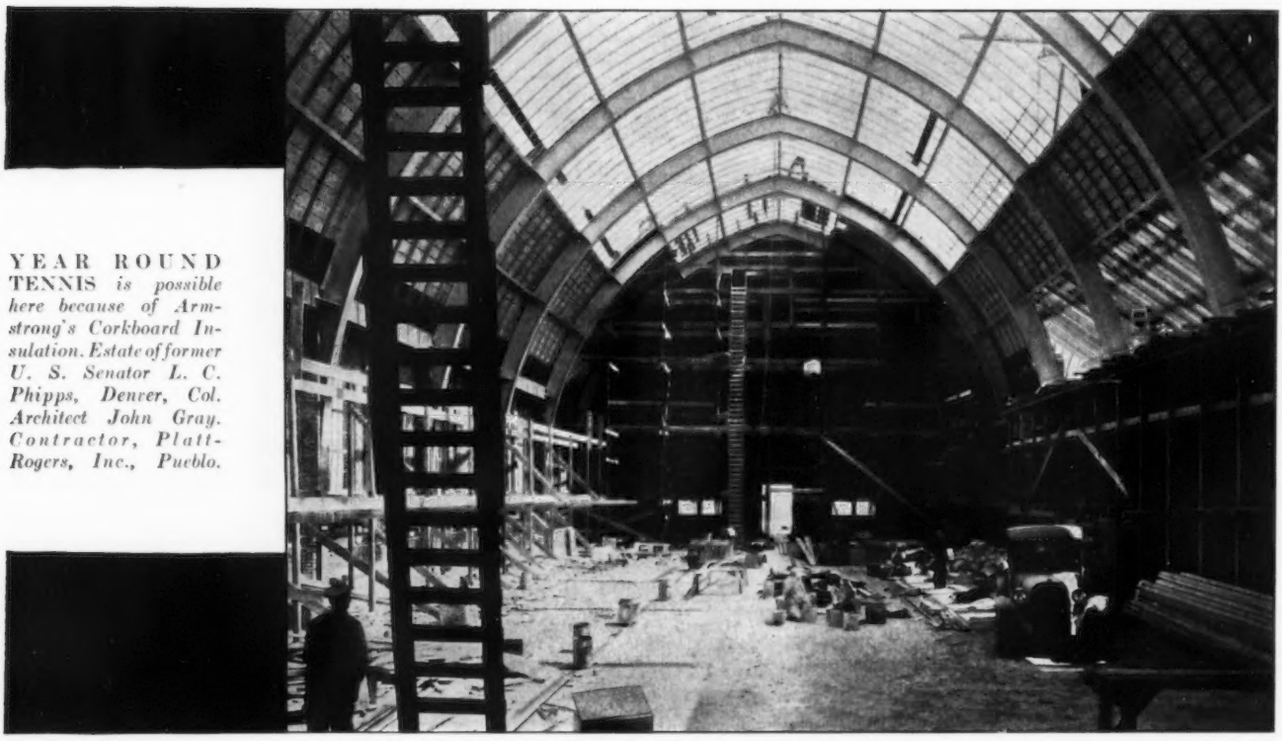
WINTER LOSES
when CORK *guards indoor tennis court*



YEAR ROUND TENNIS *is possible here because of Armstrong's Corkboard Insulation. Estate of former U. S. Senator L. C. Phipps, Denver, Col. Architect John Gray. Contractor, Platt-Rogers, Inc., Pueblo.*

EVEN a Colorado winter can't stop tennis on the estate of ex-Senator Phipps in Denver, Colorado! For the court is enclosed, and Armstrong's Corkboard insulates the building. Furnace heat, supplied through radiators set in cork-insulated recesses along the wall, stays inside!

The architect, John Gray, of Pueblo, made full use of the decorative possibilities of the cork. Each board was given a coat of cream-colored paint before it was erected, adding greatly to its attractive appearance. Because of its high insulating value, resistance to moisture, structural strength, and light weight, corkboard is the choice of many architects for all types of buildings.

* * *

You'll find Armstrong products have a wide application in the building industry. Armstrong's Corkboard provides ideal insulation for the walls and roofs of normally heated buildings, as well as for installations where low temperatures must be maintained. Armstrong's Cork Covering protects cold lines. Insulating Brick help control *high* temperatures. Many architects use them in hotels and apartment houses to protect adjacent rooms from the heat of stacks.

Armstrong's Vibracork absorbs vibration and muffles the noise that it causes. Under moving machinery, it eliminates vibration annoyances. Armstrong's Corkoustic quiets airborne noises and provides better hearing conditions. Literature describing all these Armstrong products, and samples of each are available on request. Armstrong Cork & Insulation Company, 901 Concord St., Lancaster, Pennsylvania.

Armstrong's (A) *Product*

FOR PUBLIC ARENA, TOO

The Boston Garden, huge public arena of the Boston & Maine Railroad, in Boston, Mass., has used 100,000 *board feet of Armstrong's Corkboard and three tons of granulated cork. Architects, Finck & Wilcox. Contractor, Dwight P. Robinson Company.*

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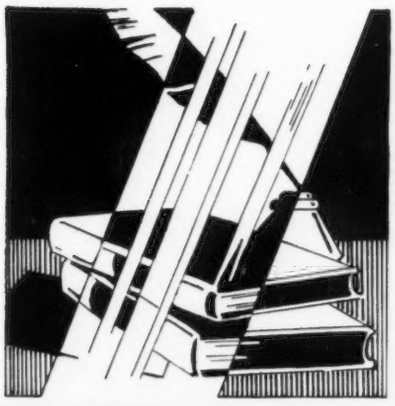

NOW... as always... the favorite specification for SCHOOLS

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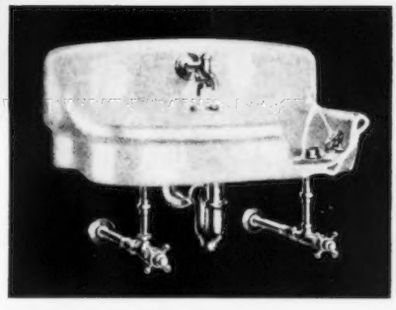

You're sure of sanitation

• There is of course a reason for the continued preference of school authorities and architects for Halsey Taylor Drinking Fountains. The question of health-safe sanitation is definitely settled once the specificacations call for these modern fountains.

• Patented features such as two-stream projector (lips need never touch supply) and automatic stream control (water at uniform height regardless of pressure changes) mean freedom from objectionable features of ordinary side-stream types and a guarantee of the utmost in drinking convenience!

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DRINKING FOUNTAINS

Types used in above building are No. 611, battery type; No. 631, semi-recess; No. 616, pedestal; and No. 605, wall-type, the latter not illustrated. All have the distinctive two-stream Halsey Taylor projector and practical automatic stream control!

Today: A SNEEZE

Tomorrow: ANOTHER IDLE WORKER

Clean Air Written into Building Specifications Creates Healthier Working Conditions

An invisible influenza germ rides into an office window on an invisible breath of air. A sneeze announces that it has begun its mischievous work; that every member of the organization must now run the risk of infection. Scientists tell us that more persons are devitalized, disabled and poisoned by the impurities contained in polluted air than by the noxious ingredients in food and water.

The buildings that house modern business are refusing to tolerate such intrusions of disease and dust and dirt. With American Air Filters, they are insuring to their users maintenance of a high degree of physical and mental efficiency. Owners recognize the importance of filtered air in keeping their buildings filled with a high class of tenants. They estimate its value still further in accumulated savings in fuel, upkeep and redecoration costs. They *expect* efficient, reliable air filtration, just as they expect lighting, heating and plumbing systems.

Architects specify American Air Filters because they are unvaryingly efficient in supplying an abundance of thoroughly clean air. Draw freely, and without obligation, on the services of our research engineers. They will help you study and solve the problems of your clients, however difficult or unusual they may be.

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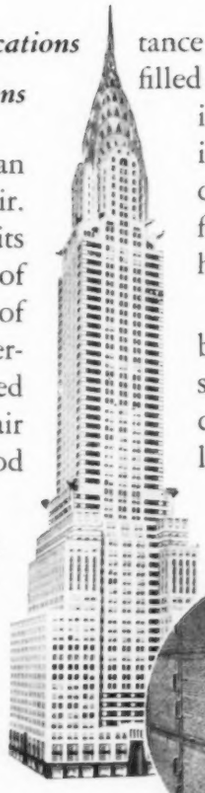
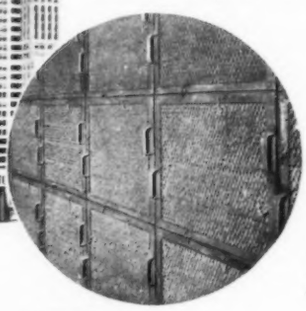


American Air Filters furnish a continuous supply of clean air to occupants of the Chrysler Building, New York City.



Typical filter unit, designed and built by American Air Filter Co., world's largest makers of air-cleaning equipment.

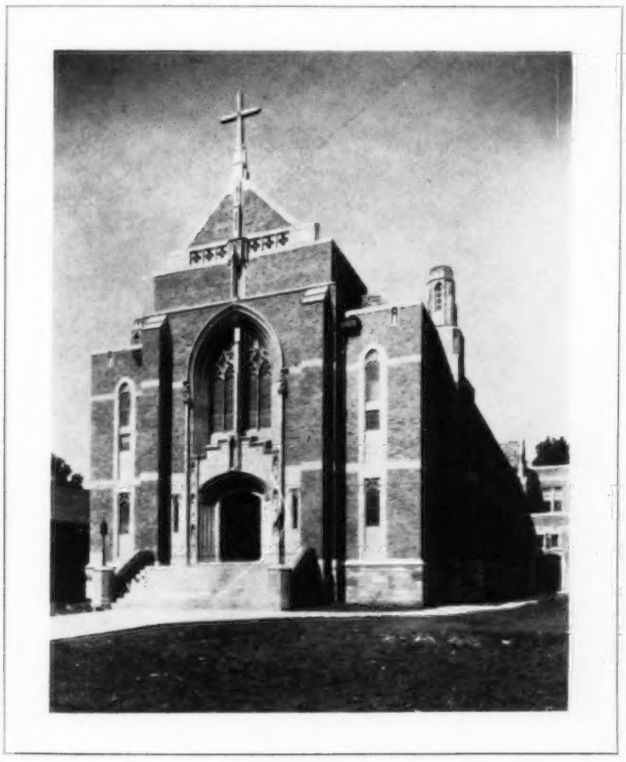
AMERICAN AIR FILTERS

CLEAN AIR: THE NEW ARCHITECTURAL RESPONSIBILITY

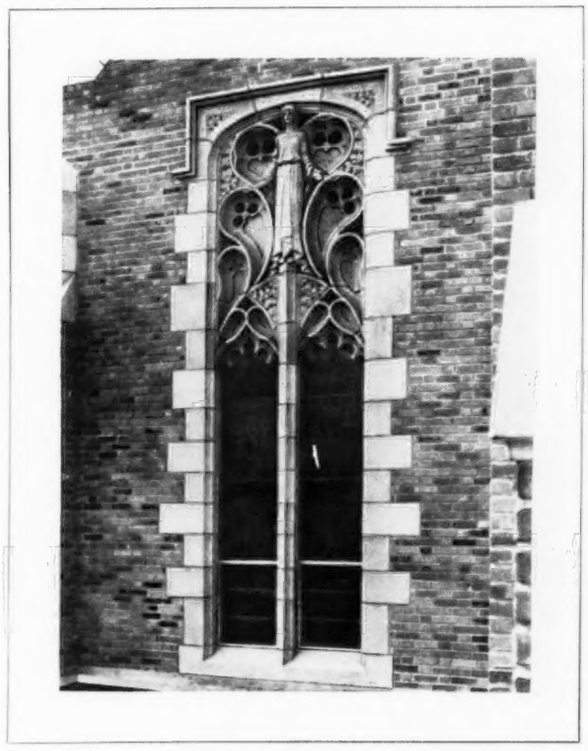
FEDERAL SEABOARD TERRA COTTA CORPORATION

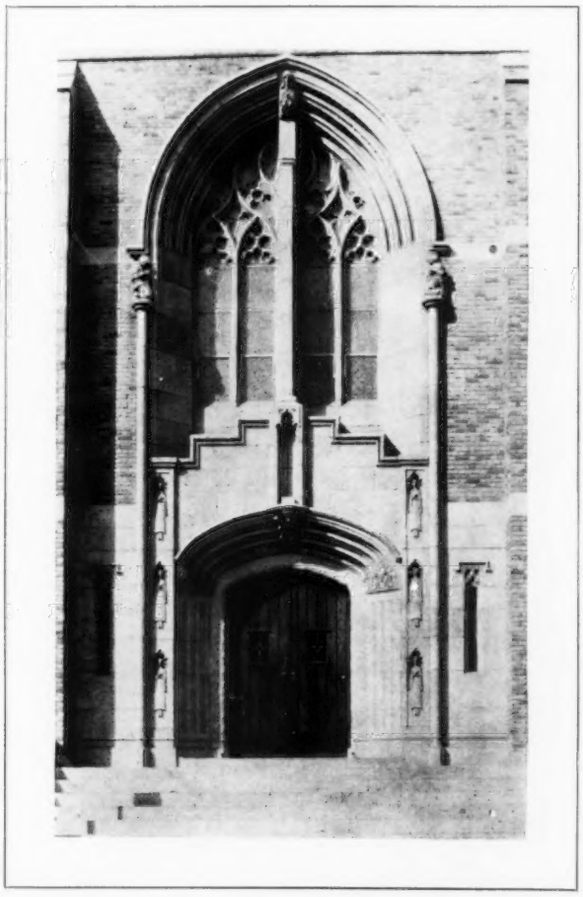
SCALE

SCALE has ceased to be a limitation in terra cotta design. FEDERAL SEABOARD terra cotta may be designed in the usual scale required by the architect. Note the unusual size of the terra cotta used by Mr. Convery in St. Genevieve's Church.



ST. GENEVIEVE'S CHURCH
Elmora, N. J.
Neil J. Convery, *Architect* Thos. Reynolds, *Builder*





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Combines Insulation with Metal Lath

This One Building Material gives you Flax-li-num Insulation, Waterproof Building Paper and Flat Expanded Painted Metal Lath . . .

WHEN you use Bi-Flax, you are getting the high insulating efficiency of Flax-li-num and the acknowledged superior plaster base qualities of metal lath.

Flax-li-num, by bureau of standards tests has a thermal conductivity of 0.31, per 1″ thickness. In Bi-Flax, none of the insulating efficiency of Flax-li-num is sacrificed. Bi-Flax has a lower thermal conductivity by test than any insulating plaster base yet developed. For the first time it is possible to put real insulation into a building with an insulating plaster base. In addition, Bi-Flax can be used effectively in sound deadening.

The building industry has accepted metal lath as the ideal plaster base. In the development of Bi-Flax, every known metal lath was analyzed and tested. The lath used in Bi-Flax is diamond mesh flat expanded painted—all is subject to rigid tests and manufactured to specification.

Flax-li-num insulation, water-proof building paper and metal lath plaster base, economically installed at one operation.

Bi-Flax represents the highest possible standard of quality and efficiency. At the same time it is economical. Combining three materials into one unit, applied in one operation, Bi-Flax saves 44% of the labor cost of applying each separately.

Architects have given Bi-Flax an unusual acceptance. Introduced a little more than a year ago, architects specifications have put more than 6,000,000 feet of Bi-Flax into all types of construction. We believe you will be interested in Bi-Flax—will recognize that Bi-Flax meets a definite demand for an efficient insulating plaster base. May we send you a sample?

FLAX-LI-NUM INSULATING CO., St. Paul, Minnesota Dept. AR-6

Please send for my inspection a sample of Bi-Flax.

NAME_____

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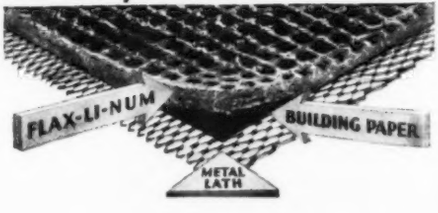
The *Only* Material of Its Kind

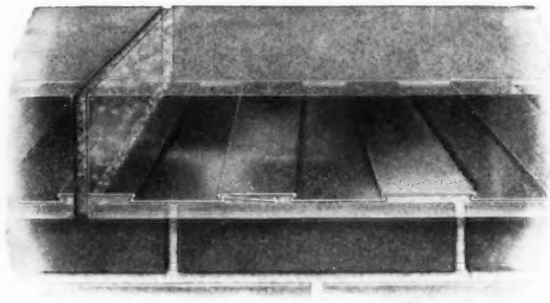


PRATT & LAMBERT VARNISH PRODUCTS

NEW CITY HALL, NIAGARA SQUARE, BUFFALO, N. Y.

Architects: Dietel & Wade — Sullivan W. Jones J. B. Barnes, Painting Contractor

EXPRESSIVE of the city's history, growth and resources. Buffalo's new City Hall, recently completed and to be officially opened early in 1932, stands out as the Queen City's most prominent structure. It is both gratifying and significant that Pratt & Lambert Varnish Products were used on the interior surfaces of this beautiful building. Whether it's a fine public building, a palatial hotel, residence or great industrial plant, the Pratt & Lambert Architectural Service Department will be happy to aid you with the proper finishing advice. Pratt & Lambert-Inc., 108 Tonawanda St., Buffalo, N. Y. Canadian address: 28 Courtwright St., Bridgeburg, Ontario.



Phantom View Thru The Wall

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PRICE — GREATLY REDUCED

INSTALLATION SUPERVISION NOW NATION WIDE

CHENEY

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INTERLOCKING THRU-WALL FLASHING

DRASTIC REDUCTIONS in the price of Cheney Interlocking Thru-Wall Flashing have been brought about by tremendously increased sales and greatly improved manufacturing facilities.

These reductions will permit Architects to specify Cheney Flashing to a much greater extent than heretofore on buildings of the first class—and will also allow its use in buildings of less expensive construction, where previously first cost has been of primary importance.

CHENEY ENGINEERING SERVICE for the supervision of Cheney installations has been so extended that the functioning of our organization is now nation wide in its scope and Cheney Flashing is standard construction throughout the United States and Canada.

You already know the merits of Cheney Flashing—how this material laid in the mortar bed, without the usual necessary soldering expense, runs completely through the masonry wall and prevents seepage, leaks, and efflorescence.

You also know how the dovetail splayed keys at intervals throughout the length of the flashing form a perfect mechanical key-bond in *every* direction within the wall, eliminating all fear of weakening the structure.

Cheney Flashing *"Solves Seepage Problems Safely."*

A New Cheney Catalogue is now awaiting your inquiry

Our Catalogue is filed in Sweet's Architectural Catalogues

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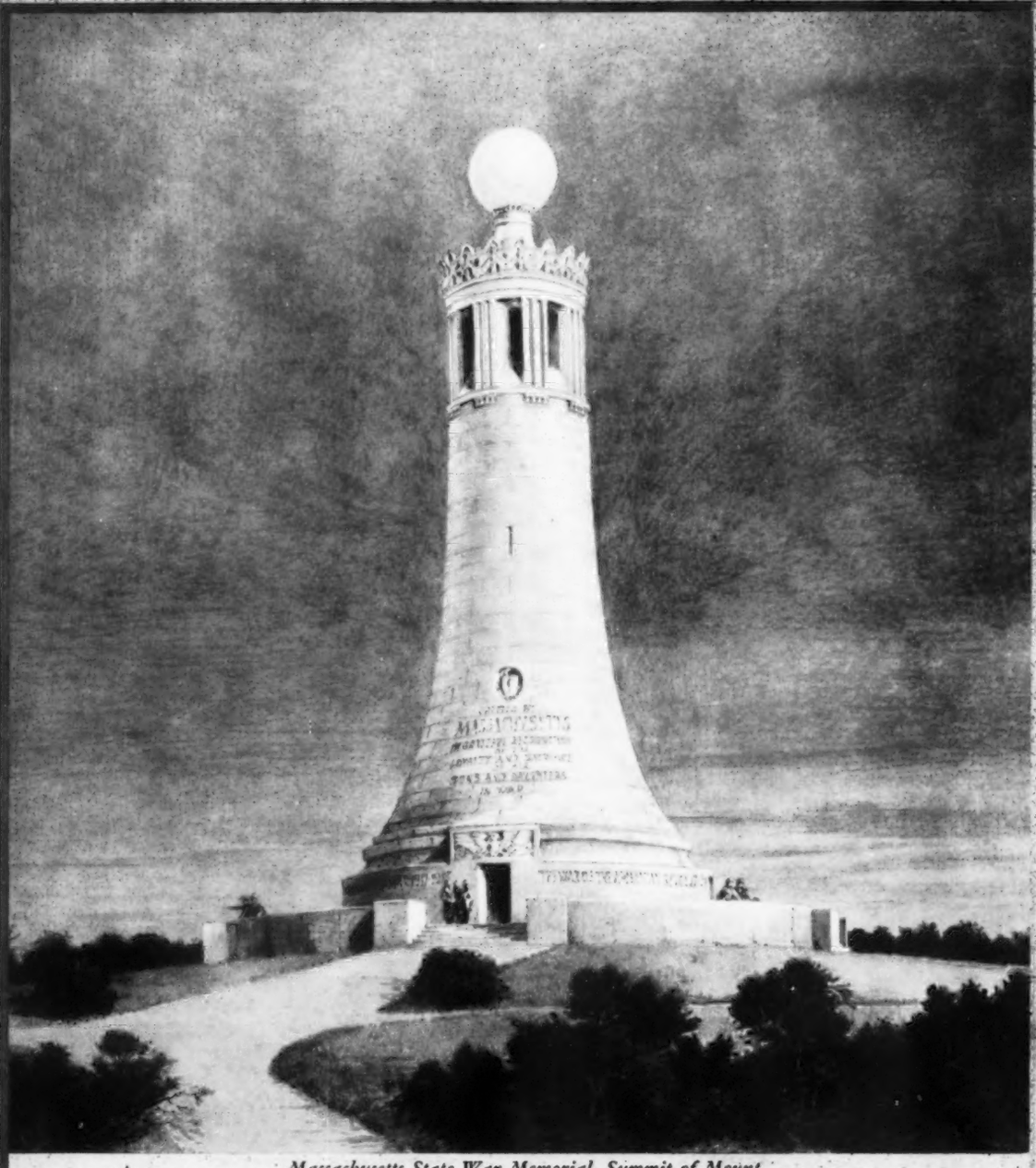
Combinations of movable and fixed panels offer a wide latitude in arrangement, appearance, dimension and amount of ventilation. The new tilting-in ventilator at the sill — a self-contained wind guard — is especially popular. Vertical swing leaves open and close easily, silently, on bronze hinge-bearings, and are locked, weather-tight, by solid bronze hardware, without touching the Fenestra inside screens.

DETROIT STEEL PRODUCTS COMPANY, 2285 EAST GRAND BOULEVARD, DETROIT, MICHIGAN

Fenestra

SCREENED FENMARK WINDOWS



Massachusetts State War Memorial, Summit of Mount Greylock, Massachusetts. Maginnis & Walsh, Architects

ON THE summit of Mount Greylock in the State of Massachusetts, stands this war memorial, entirely faced with granite. Because of its durability, its inherent character, and its beauty, no other material is so perfectly suitable.

National Building Granite Quarries Assn.
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H. H. Sherman, *Secretary*

GRANITE

ANNOUNCEMENTS

C. Bertram French has established offices for the practice of architecture at 31 East Ridgewood Avenue, Ridgewood, N. J.

Harry B. Mulliken, architect, announces the removal of his office to the McIntyre Building, 874 Broadway, New York City.

Samuel Z. Moskowitz announces the opening of his office for the practice of architecture at 578 Madison Avenue, New York City.

Emory Roth, architect, has removed his offices from 1440 Broadway, to 18 East 48th Street, New York City.

Raphael V. Serrano, architect, has acquired office space at 1420 Chestnut Street, Philadelphia. Mr. Serrano is also maintaining his present office at 1505 Bywood Avenue, Beverly Hills (Upper Darby P. O.), Pa.

By mutual agreement Ivan H. Riley and Oivin H. Grimsgaard, who have been associated under the firm name of Ivan H. Riley and Company, 203 No. Wabash, Chicago, have dissolved the company. Mr. Grimsgaard has returned to Norway. Mr. Riley has established offices in the State-National Bank Building, Brownsville, Texas, and Baxter Building, Harlingen, Texas, to engage in a general practice in the lower Rio Grande Valley of Texas.

BROOKLYN CHAPTER, A. I. A.

At the dinner meeting of the Brooklyn Chapter, American Institute of Architects, at the Crescent Athletic Club, October 26, it was decided, owing to the lack of students, to abandon the Atelier temporarily and renew it next season or when the student interest is again increased. The Chapter made an appropriation for the unemployed and sent an appeal to all members to assist to their limit. Paul Wunderlich gave a talk on the latest phases of heating, ventilating and air conditioning.

COMPETITION FOR UNEMPLOYED DRAFTSMEN

To aid unemployed draftsmen, the Architects' Emergency Committee of the Region of New York will conduct a competition for the design of a membership certificate in the New York State Council of Registered Architects, it is announced by Julian Clarence Levi, chairman. The competition is open to architects and draftsmen living or working in New York. One design only may be submitted by a contestant.

A first prize of $100, a second of $50, a third of $35, a fourth of $25, and ten others of $20 each are offered. Designs will be judged on composition, decorative embellishments, if any, and the lettering. Copies of the program may be had upon application to the Architects' Emergency Committee, 115 East 40th Street, New York City.

HOUSE INSULATION BOOKLET

Authorities on building and housing, headed by LeRoy E. Kern of Washington, D. C., representing the American Institute of Architects, have cooperated with the National Committee on Wood Utilization of the Department of Commerce in the publication of House Insulation:. Its Economies and Application, the Committee's latest report in the building and construction field.

The 52-page bulletin is written by Russell E. Backstrom, insulation specialist. It is fully illustrated and nontechnical in its treatment of the subject. It may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., or from the district offices of the Department of Commerce in principal trade centers. The price is 10 cents a single copy.

ARCHITECTURE AS A CAREER

Leaflet No. 10 in the Department of the Interior series on professional careers has just been issued. It supplies needed information to students who are considering architecture as an occupation. It may be obtained from the Superintendent of Documents, Washington, D. C., at 5 cents a copy.

EVENTS AND COMPETITIONS

Dec. 1-15	The 34th Architectural Exhibition, conducted jointly by the Philadelphia Chapter of the American Institute of Architects and the T-Square Club. The Exhibition will be held in the Architects Building, Philadelphia.
December 3	"Radio City," by Raymond Hood, one of its architects. The New School for Social Research, New York.
Dec. 2-5	The President's Conference on Home Building and Home Ownership, Washington, D. C.
December 10	"Port Authority Planning," a lecture at the New School for Social Research, New York.
December 15	Closing date for entries for the second annual building awards competition, conducted by the Brooklyn Chamber of Commerce, 66 Court Street, Brooklyn, N. Y.
December 17	"Village and Town Planning," a lecture at the New School for Social Research, New York.
December 31	Closing date of competition to design a magazine cover and format. Address the Competition Secretary, The Architectural Forum, 220 East 42nd Street, New York City.
1932	
January 7	"County and Parkway Planning," by Major Gilmore Clarke of the Westchester County Parkway Commission. The New School for Social Research, New York.
January 7	Closing date of competition for a monument at Appomattox Court House, Virginia, to commemorate the termination of the Civil War. Address the office of the Quartermaster General, Munitions Building, Washington, D. C.
January 14	"Cheap Housing and Slum Elimination," a symposium at the New School for Social Research, New York.
January 18	Closing date for applications for the James Templeton Kelley Fellowship in Architecture. Address Niels H. Larson, Boston Society of Architects, 814 Statler Building, Boston.
January 20	"George Washington Bridge," a lecture at the New School for Social Research, New York.
Jan. 25-29	Second International Heating and Ventilating Exposition, Cleveland. In conjunction with annual meeting of American Society of Heating and Ventilating Engineers.
February 1	Closing date for entries in the annual Prizes of Rome competition. Address Roscoe Guernsey, Secretary, American Academy in Rome, 101 Park Avenue, New York City.
Feb. 26 March 12	Exhibition of the Architectural League of New York.
October	International Congress for Modern Architecture at Moscow, U.S.S.R. Program: "The Functional City."
1933	
October	"A Century of Progress," International Exposition at Chicago. International Congress for Modern Architecture, to be held in Chicago in conjunction with the World's Fair.

A PRIZE-WINNING DESIGN—1931
BOYS' SCHOOL AT CRANBROOK, MICH.
ELIEL SAARINEN, ARCHITECT

THE JANUARY ISSUE

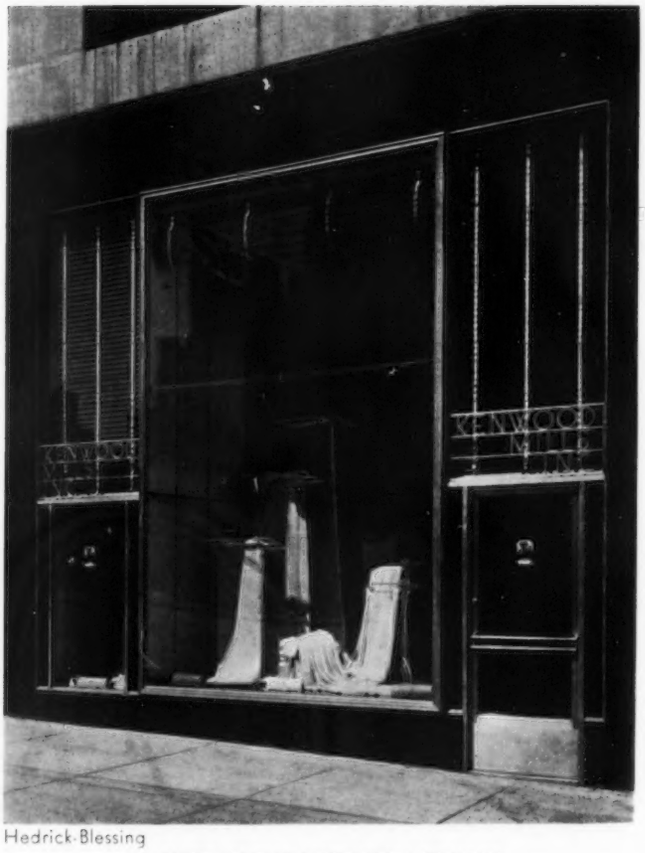
This issue will review the prize-winning buildings of 1930-1931. An article by Professor Joseph Hudnut of Columbia University will discuss evolutionary trends in design and the relationship between new expressions in design and accepted standards.

Another article will be a résumé of the outstanding recommendations of The President's Conference on Housing.

Dwellings Designed by Architects for Rental or for Sale, by Henry Wright, is one of a series on housing. It will give a comparison of the costs of producing houses with the costs of marketing, and an analysis of their yearly costs in actual use.

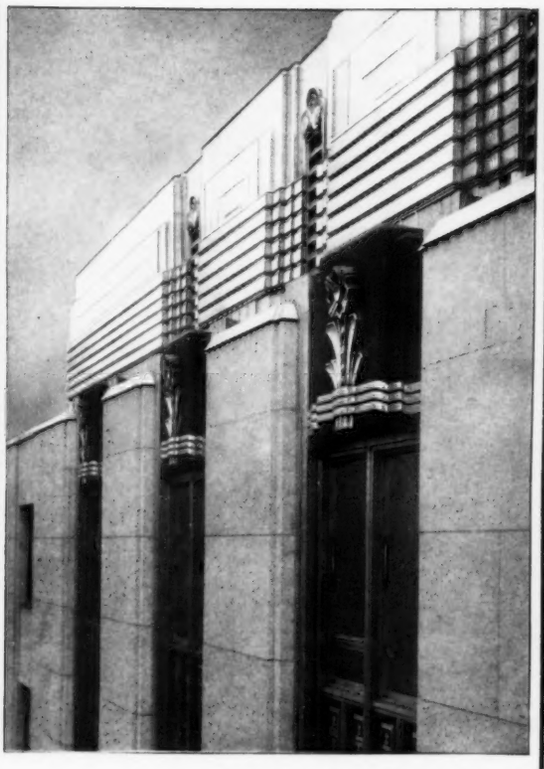
The Portfolio of Current Architecture will include outstanding new buildings completed too late in 1931 to be considered under the awards group. In addition there will be illustrations of a group of country houses.

The Technical News and Research study will deal with recent scientific discoveries and technological inventions that have a bearing on architecture. Light, strong, metal alloys; new building materials with controlled physical properties; lightweight, easily assembled constructions; new production methods and labor-saving devices for material handling are among the elements discussed.



Hedrick-Blessing

A SHOP IN THE MICHIGAN SQUARE
BUILDING IN CHICAGO
HOLABIRD AND ROOT, ARCHITECTS



Federal Reserve Branch Bank Pittsburgh, Penna.

Federal Reserve Branch Bank, *Architect:* Walker and Weeks, Cleveland, Ohio; *General Contractor:* Mellon Stuart, Pittsburgh, Pa.; *Aluminum Sheet Metal Contractor:* W. F. Overly and Sons, Greensburg, Pa.: *Ornamental Contractor on Aluminum Work:* John Harsch Bronze and Foundry Co., Cleveland, Ohio; *Aluminum Sash Contractor:* The Kawneer Manufacturing Co., Niles, Michigan.

Discarding discussion for reality . .

The exterior of the 8th floor curtain wall is built of 1/8 inch flat plates and extruded moulding of Alcoa Aluminum . .

This wall was actually built at the factory and delivered to the job in units. The planes of the vertical panels of ⅛-inch flat plates of Alcoa Aluminum were relieved by horizontal bars of extruded moulding. The wall consists of 3″ steel channels with the aluminum plate and extruded moulding fastened to the outer side. Expanded metal lath, plastered, forms the inner wall. The intervening space is filled with rock wool blown into place by air pressure.

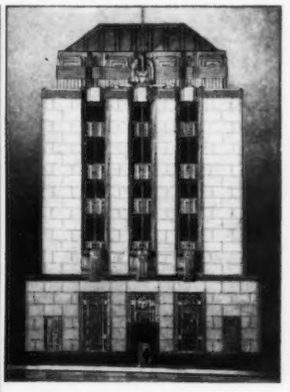
Erected in a fraction of the time needed for masonry construction this aluminized curtain wall weighs approximately 25 lbs. per sq. ft. It is 3½ inches thick but it has an insulation value equal to a masonry wall of 32-inch thickness. It adds at least 10 inches of usable space around the entire perimeter of the room.

Aside from this new and interesting curtain wall the roof, doors, windows and ventilators of the 8th floor are also constructed of Alcoa Aluminum. On the other 7 floors Alcoa Aluminum is used for 160 windows, the heavy grille work on the lower floor windows, 154 spandrels and the flagpole. The interior banking screens and radiator grilles are also made of Alcoa Aluminum and the "three wide" belt course at the first set back is of extruded aluminum.

The use of Alcoa Aluminum for curtain walls is a logical development. Alcoa Aluminum is strong but light. It weighs only ⅓ as much as previously used metals. It will not weather streak on to adjoining surfaces. And it is low in cost, comparable to other metals that do not have its very decided advantages.

SPECIFICATIONS

Alcoa No. 43 Aluminum Alloy is recommended for most architectural purposes. To meet the numerous demands for structural stability, Alcoa Aluminum alloys are available in various tensile strengths. In designing and writing specifications for buildings in which Alcoa Aluminum alloys will form a part, may we urge you to accept our cooperation without obligation? ALUMINUM COMPANY of AMERICA; 2467 Oliver Bldg., PITTSBURGH, PA.



Federal ReserveBranch Bank, Pittsburgh, Penna.

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New Orleans Municipal Auditorium

This stupendous structure is assured a bountiful supply of heat by the

Sarco Heating System

Another monument to the good judgement and ability of Favrot & Livaudais, Ltd., Architects; A. G. Rose, Inc., Plumbing & Heating Contractors, and F. H. Chisholm, Consulting Engineers, is this $2,000,000 auditorium which seats 10,500 people.

The more costly a building, the greater is the responsibility of selecting its equipment. In buildings of this type you will find the Sarco Heating System.

Sarco Vacuum and Vapor Heating Systems are installed in many hundreds of the country's finest buildings.

For the convenience of architects, engineers and contractors, we maintain a competent force of practical heating engineers, who are available for consultation as to the best Sarco System to suit specific conditions. We gladly give assistance with special details of application and furnish information, based upon our long and varied experience, on any phase of vapor and vacuum heating.

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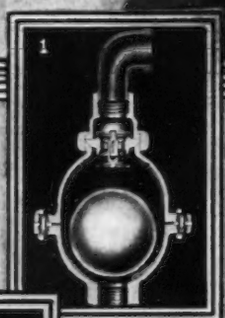
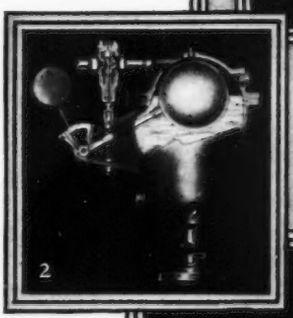
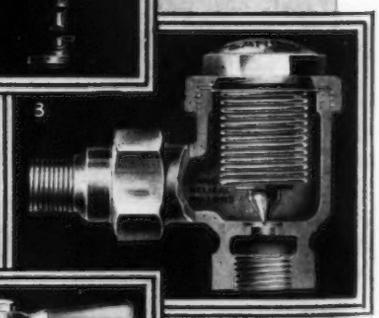
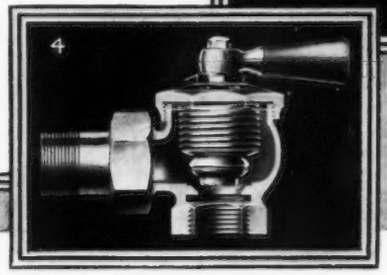


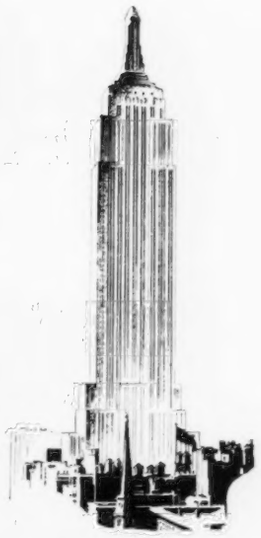






See our exhibit at Booth No. 150 at the International Heating & Ventilating Exposition, Cleveland, O., January 25th to 29th, inclusive.

TILE SLABS



EMPIRE STATE CLUB — *Roof terrace on set-back at 21st floor;* **EMPIRE STATE BUILDING.** *Shreve, Lamb & Harmon, Architects; Starrett Bros. & Ekin, Contractors. Ludowici Tile Slabs laid by Tuttle Roofing Co.*

NEW YORK CENTRAL BUILDING. *Warren & Wetmore, Architects; James Stewart & Co., Contractors. Ludowici Tile Slabs laid by Master Waterproofers, Inc.*

In the background, **THE WALDORF-ASTORIA.** *Schulze & Weaver, Architects; Thompson-Starrett Co., Contractors. Ludowici Tile Slabs laid by Tide Water Roofing Co.*

The use of Ludowici Tile is not confined to sloping roofs. • For flat roofs and set-backs, and also for floors and drives, Ludowici Tile Slabs are an ideal covering. • Impervious to moisture — permanently durable — proof against acids — they are particularly suitable where exposed to weather, wear or unusual conditions. • These qualities, in addition to attractive appearance and a safe walking surface, are inherent in this standard product. • The character of the structures on which millions of these slabs have been used is positive assurance of outstanding merit. • Ludowici Tile Slabs are made in a number of patterns, colors and sizes, with fittings to match. • Let us send you samples and information. • Our pages in Sweet's contain helpful data and our representatives are at your service.

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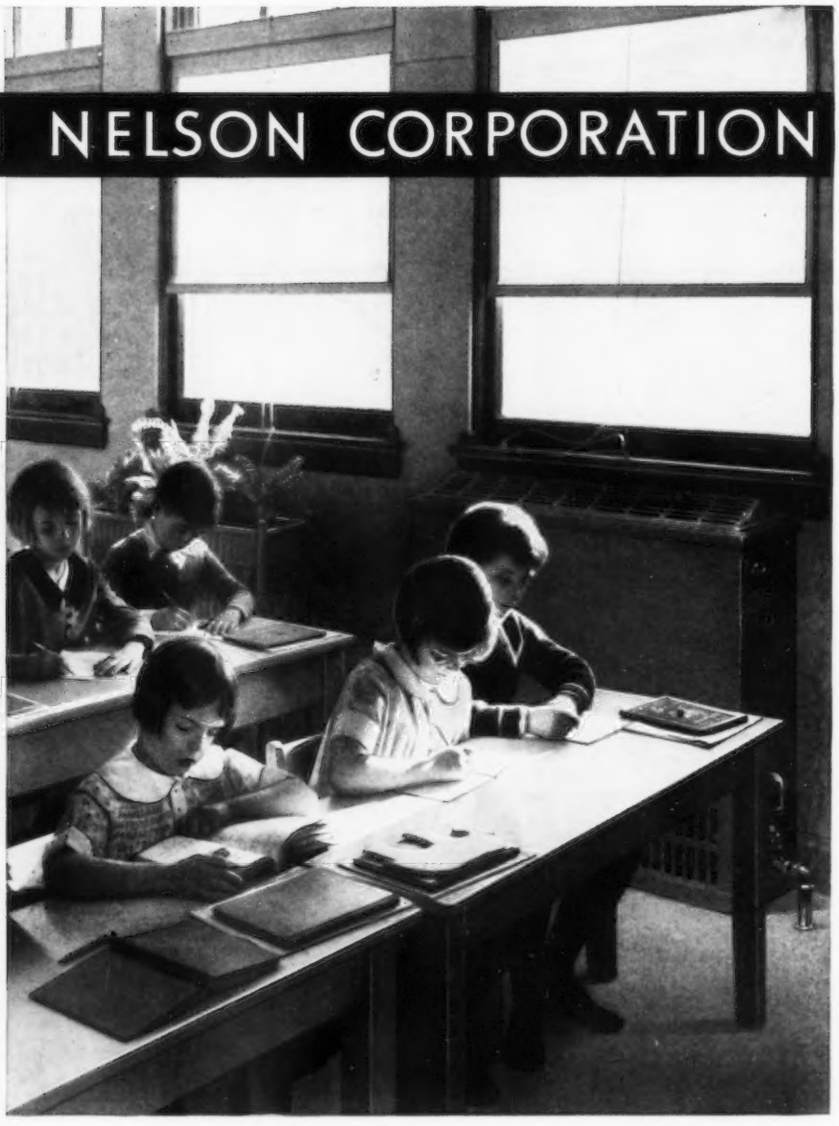
THE HERMAN NELSON CORPORATION



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The Herman Nelson Corporation are makers of the *Univent System of Ventilation*, the *Her-Nel-Co System of Ventilation*, the *Herman Nelson Invisible Radiator*, the *Herman Nelson hi Jet Heater*, and other heating and ventilating equipment.

Engineers, architects and school authorities see in the Her-Nel-Co System of Ventilation the practical solution of a most harassing problem.

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School authorities, engineers, and architects interested in securing better ventilation, at a saving in fuel, maintenance and building costs, should write for the book, "The Herman Nelson Her-Nel-Co System of Ventilation".

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THIS ROOF PROVIDES PERMANENT COMFORT-

Comfort and economy are being built into this roof of the Davenport Hosiery Mills, Chattanooga, Tenn., with Armstrong's Temlok.

It's merely a matter of protecting the roofs you specify with Armstrong's Temlok, the lasting insulation

WINTER'S frigid threat is just a bluff to buildings that are properly insulated. When the industrial roofs you specify are protected with Armstrong's Temlok, you can be sure that top-floor offices will be comfortably warm as long as winter lasts—and as long as the roof stands. Summer's heat, too, is warded off.

This comfort for buildings is permanent. For Temlok, the new, improved, low-cost fibreboard, is permanent insulation. It is fabricated from the heartwood fibres of southern pine. These fibres are resin-impregnated by Nature and thus are highly resistant to moisture. When they are manufactured into insulation, they retain their permanent moisture resistance. So Armstrong's Temlok performs efficiently for a lifetime.

In spite of these added advantages, Armstrong's Temlok is low in cost. A vast supply of raw material readily available at low cost, and modern manufacturing methods in the Temlok insulating board plant at Pensacola, Florida, permit economies that result in Temlok being sold at a low price.

Temlok is made in varying thicknesses for adequate protection of any roof. It is easily worked and quickly laid. Structurally strong, it provides a firm base for roofing. We suggest that you mail the coupon to us immediately. Address Armstrong Cork & Insulation Company, 901 Concord Street, Lancaster, Pennsylvania.

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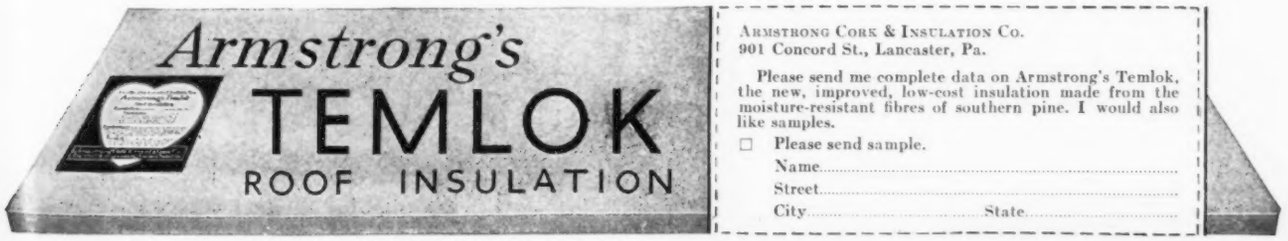

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901 Concord St., Lancaster, Pa.

Please send me complete data on Armstrong's Temlok, the new, improved, low-cost insulation made from the moisture-resistant fibres of southern pine. I would also like samples.

☐ Please send sample.

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THE CARLTON LAVATORY
Plate No. 2192-T

Beauty of line is but one *feature of this new*

TE-PE-CO
LAVATORY

ALTHOUGH measuring but 24″ by 21″ overall, this lavatory has an extra large bowl area—19½″ by 12½″—far more spacious than is usually the case in much larger size lavatories. The elevated shelf and compact type of fitting provide a greater expanse of slab space than ordinarily found. They also prevent any possibility of back syphonage. Add to these advantages — the distinguished design — the durability — the sanitary qualities for which Te-Pe-Co products are famous. Then study the photograph and you'll agree that the recognition already accorded this newest of Te-Pe-Co Lavatories is well deserved.

Our Guarantee

OUR GUARANTEE — We make but one grade of ware — the best that can be produced—and sell it at reasonable prices. We sell no seconds or culls. Our ware is guaranteed to be equal in quality and durability to any sanitary ware made in the world. The Te-pe-co trade mark is found on all goods manufactured by us and is your guarantee that you have received that for which you have paid.

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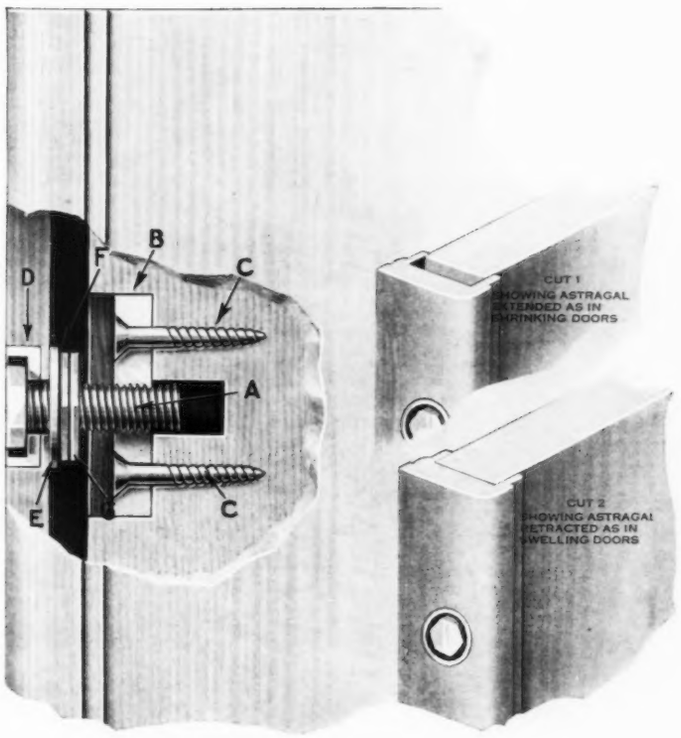
Introducing the New



COMPENSATING ASTRAGAL FIXTURE

The adjustment of the astragal by means of this new device is accomplished by merely turning four bolts with a special wrench. The work is done by the custodian, skilled labor being unnecessary. Maintenance cost is practically eliminated.

This device overcomes the objectionable features of pairs of doors designed to operate independently.

As you know, such doors must be made flat faced, regardless of whether or not they are to be equipped with panic bolts. Unfortunately, they shrink and swell with the changes of the weather, causing sticking, or enlarging the gap to the point where air enters, cold drafts are present, fuel is wasted, and sometimes the picking of the lock is made possible. The new Von Duprin Compensating Astragal Fixture No. 1246 completely and simply overcomes this difficulty, since it provides for the easy and quick adjustment of the gap. When the doors shrink or swell, it is a matter of less than a minute to put them in perfect adjustment.

Ask us to send complete details.

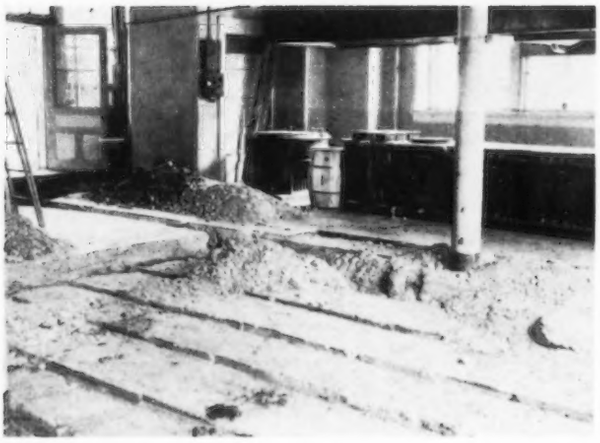
VONNEGUT HARDWARE CO.
Indianapolis, Ind.

Von Duprin

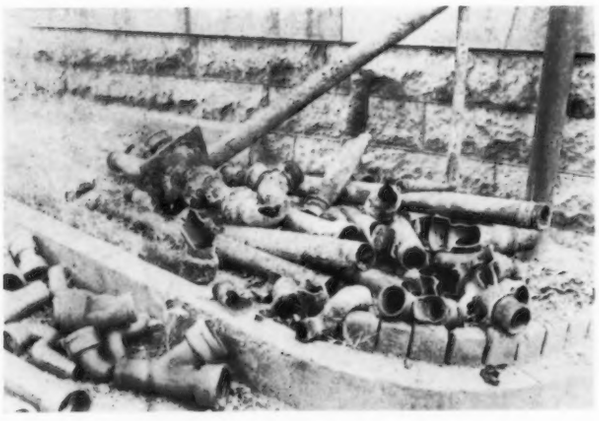
REG. U. S. PAT. OFF.

Self-Releasing Fire and Panic Exit Latches

BEWARE *kitchen wastes*



In the kitchen of the University of Dayton, it was necessary to excavate because of corrosion.



Food acids and cleaning compounds did this damage. Replacement was made with Duriron Acid-proof Drain-pipe.

The pictures here tell what happened to ordinary drain-pipe laid in clean gravel under concrete floor, in the KITCHEN of the University of Dayton. This pipe had to be dug up, so badly was it corroded. The extent of the corrosion may be visualized from the lower illustration.

It is a graphic example of how fruit juices, food acids and cleaning compounds *in kitchen wastes*, puncture, eat away and destroy ordinary drain-pipe.

To forestall anything like this happening again—and to save future expense and trouble—Brother Joseph Weissmann, Purchasing Agent of the University of Dayton, specified Duriron Acid-proof Drain-pipe to replace the old pipe.

Duriron Acid-proof Drain-pipe is installed like extra heavy cast iron. Joints are calked tight against leakage. Because it has a greater life expectancy than the building in which it is placed, Duriron Pipe is acknowledged protection against acid laboratory wastes.

It is just as important to install Duriron Pipe to handle *kitchen wastes* in hotels, hospitals, institutions, schools and similar buildings. Complete particulars on request.

THE DURIRON COMPANY, Inc.
404 N. Findlay Street Dayton, Ohio

DURIRON ACID PROOF DRAIN-PIPE

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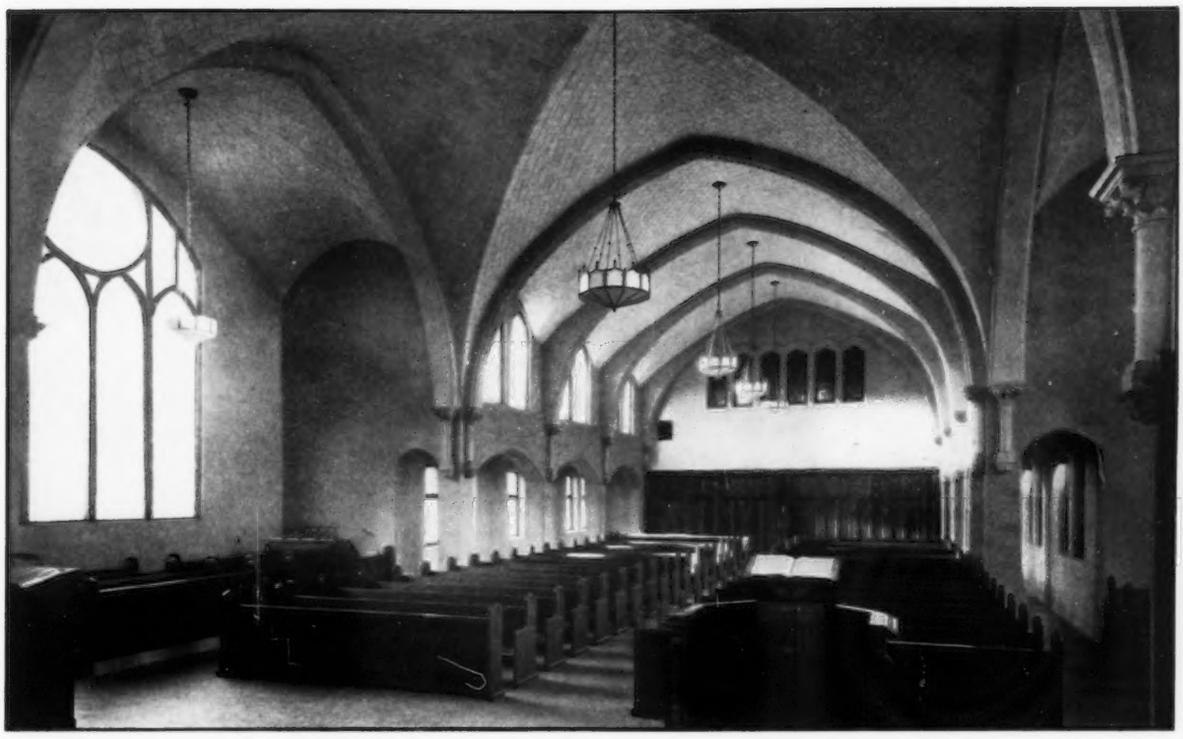

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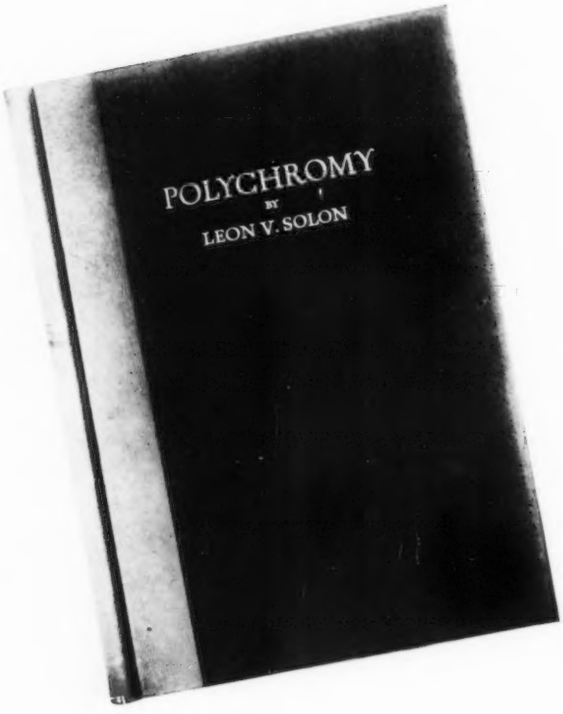
POLYCHROMY

BY

LEON V. SOLON

with a foreword by RALPH ADAMS CRAM



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Mr. Solon has made exhaustive research from every angle of consideration, with the view to formulating basic principles which will guide practice and be independent of peculiarities in stylistic expression.

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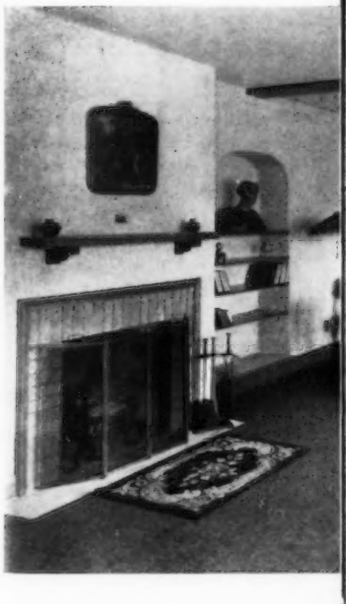

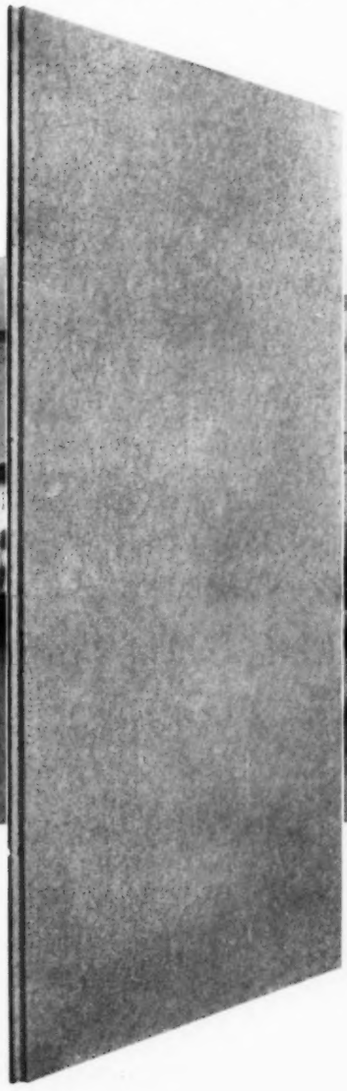

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Following Mr. Walker's graduation from Massachusetts Institute of Technology, he spent several years abroad. Upon his return he began the practice of architecture in Boston, with the firm of Guy Lowell, later going to New York as the manager of Mr. Lowell's New York office.

In 1905, at the suggestion of John Merven Carrerre, of Carrerre and Hastings, of New York, who was then a member of Cleveland's Mall Plan Commission, Mr. Walker went to Cleveland to become interested in the public building and city planning of the city, being associated with J. Milton Dyer at the time of the building of Cleveland's City Hall, the first important building on the proposed Mall. Mr. Weeks practiced his profession in Pittsfield until he also went to Cleveland to become a member of Mr. Dyer's organization.

During its early years, this office specialized in buildings for banks and designed more than 60 in Ohio alone. More recent work includes: Central Depositors Bank & Trust Co., Akron; Lincoln National Bank, Fort Wayne; Pittsburgh Federal Reserve Bank (being built), Euclid Avenue Baptist Church, University School for Boys, Hathaway-Brown School for Girls, Severance Hall, Board of Education Administration Building, all in Cleveland, and the Harrison County Court House at Clarksburg, W. Va., now building.

Walker & Weeks' design for the Main Public Library of Cleveland located on the Mall was the winning design in a national competition, as was their design for the Indiana World War Memorial, state memorial including the national headquarters building of the American Legion. This memorial, now under construction, is to occupy five city blocks in the heart of Indianapolis.

Walker & Weeks won the Ohio State competition for a Memorial Bridge over the Scheldt River near Eyne, Belgium, built by the State of Ohio in memory of members of the Thirty-seventh Division from Ohio, who lost their lives during the World War in action near this site.

The new Cleveland Post Office is to be designed by Walker & Weeks and Phillip Small associated.

Mr. Walker has served as a member of the Advisory Staff of Massachusetts Institute of Technology, is a member of the Advisory Board of the Cleveland School of Art, Trustee of the Cleveland Natural History Museum, is a Life Member of the Cleveland Museum of Art, a Fellow of the American Institute of Architects and a past President of the Cleveland Chapter of the American Institute of Architects.

Two commissions recently executed by the office of Walker & Weeks. Above, Central Depositors Bank and Trust Company, Akron; left, Administration Building, Cleveland Board of Education.

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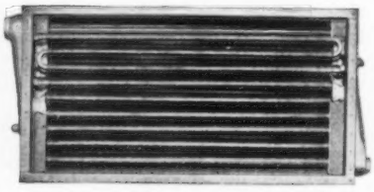

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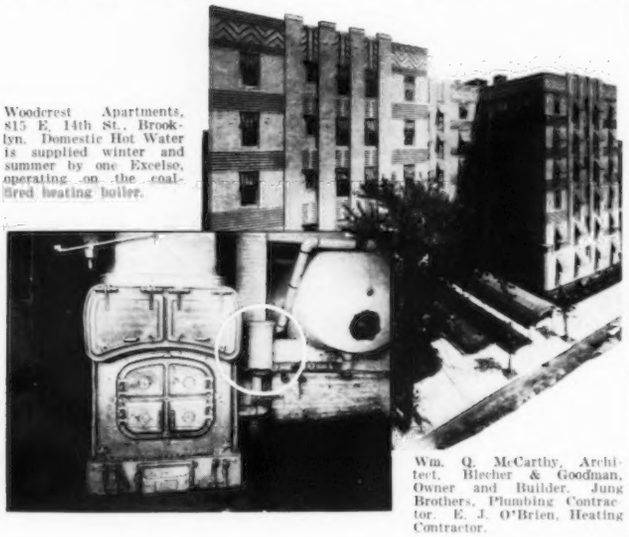

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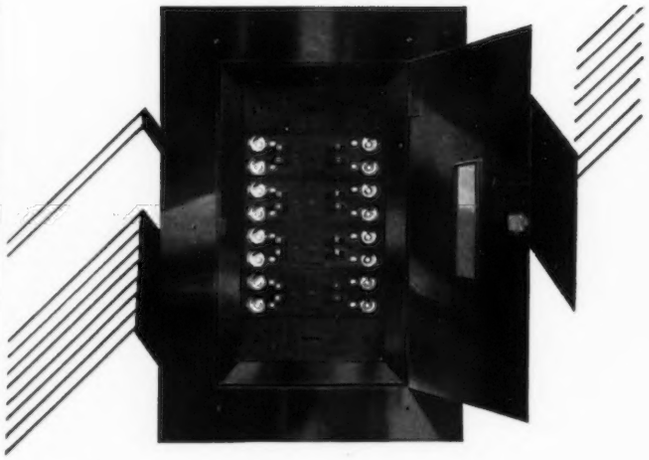

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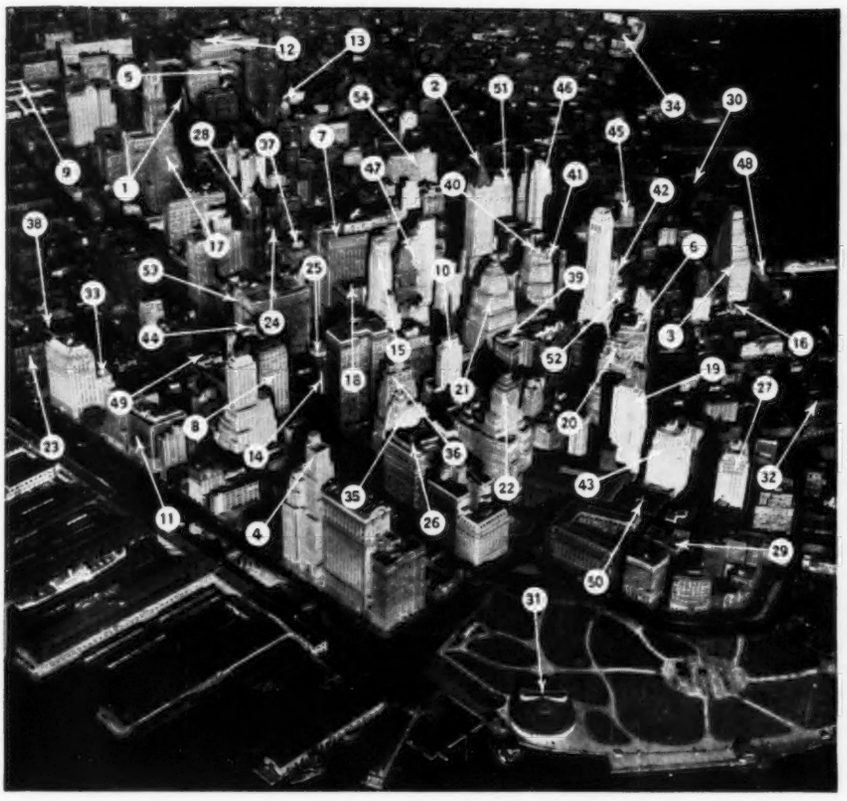

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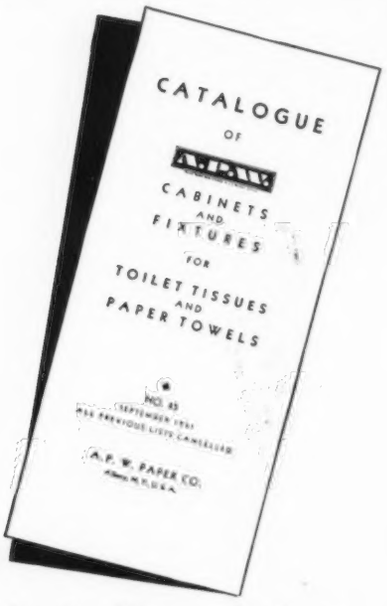

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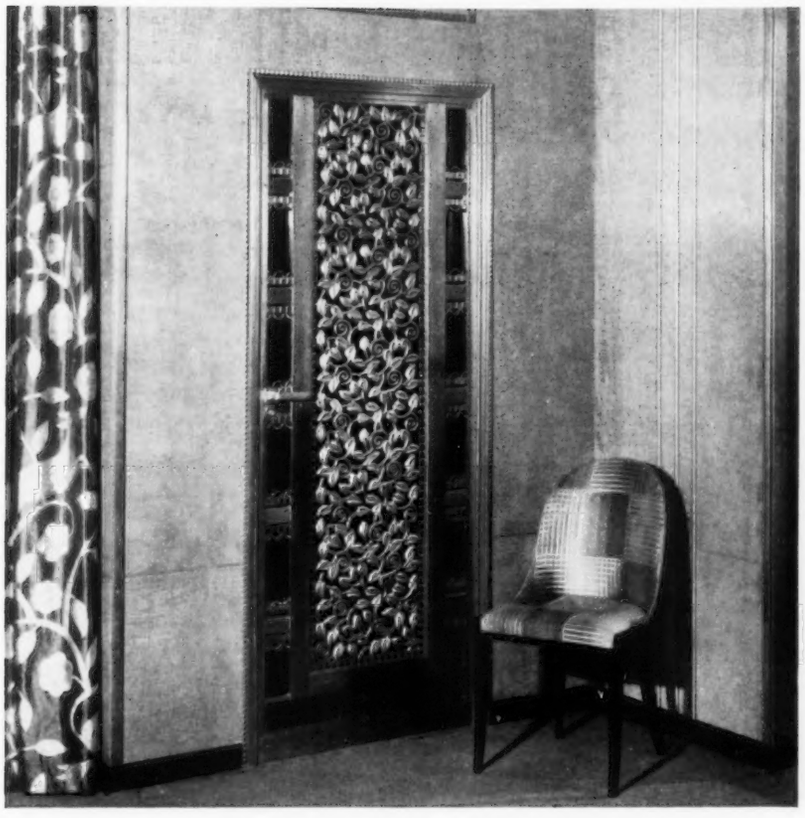

Ornamental metal door with background and panels of black Bakelite Laminated, in the fur department of the Bonwit Teller store, New York City.

Gleaming metal
in a setting of lustrous Bakelite Laminated

A fine jewel takes on added depth and fire in an appropriate setting. A splendid structure draws some of its beauty from its surroundings. Even an ornamental door may reflect the borrowed lustre of its background.

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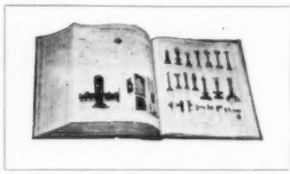

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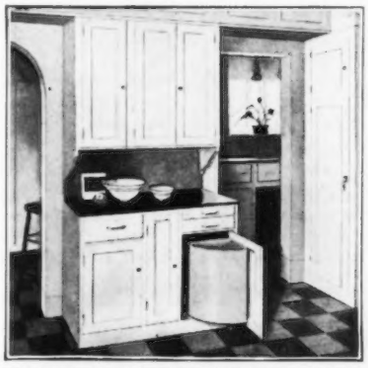

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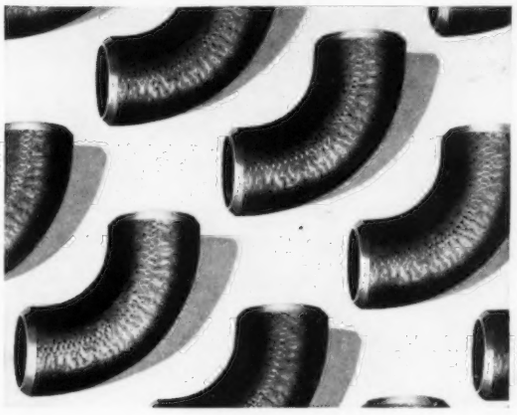

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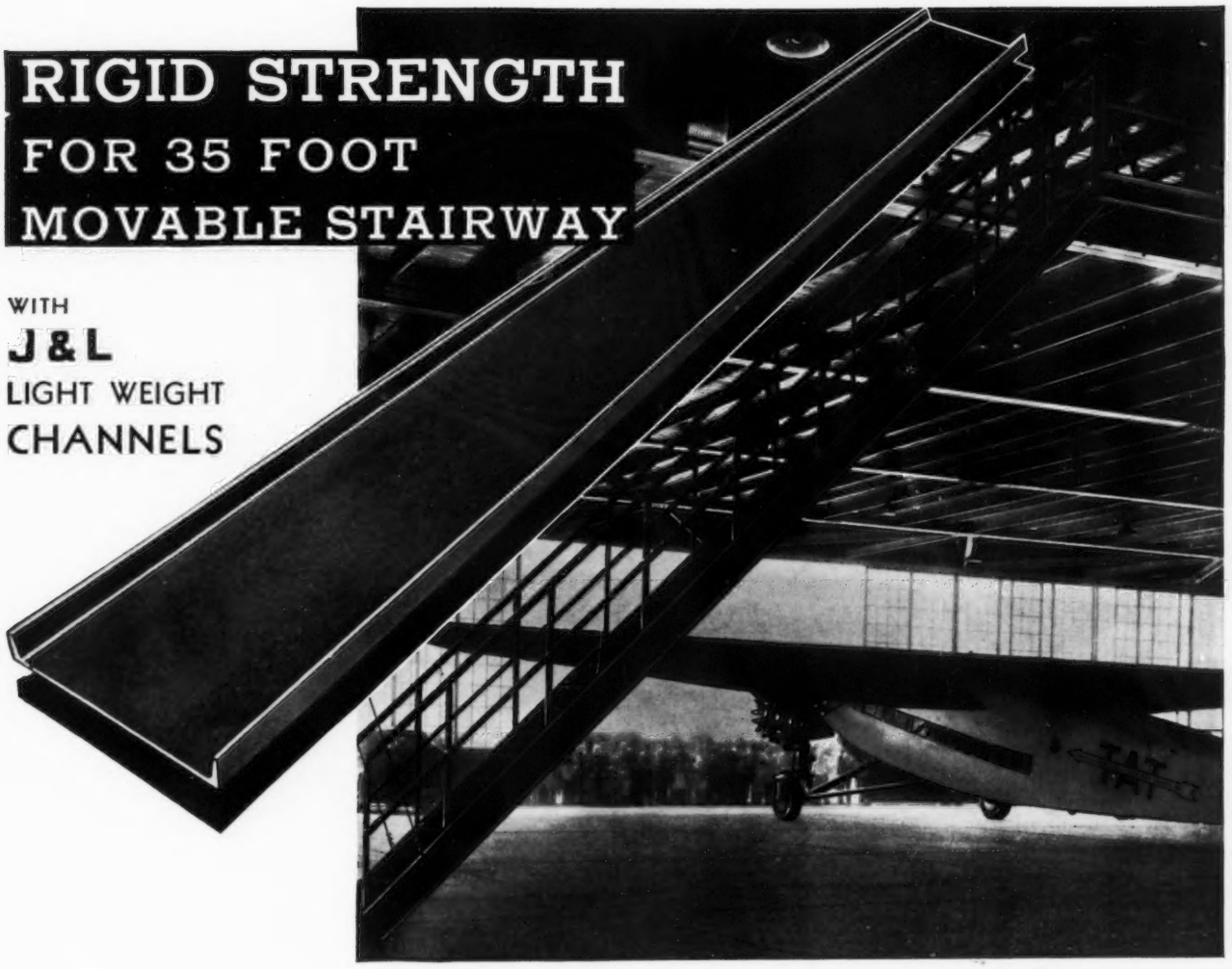

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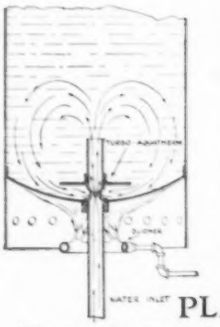

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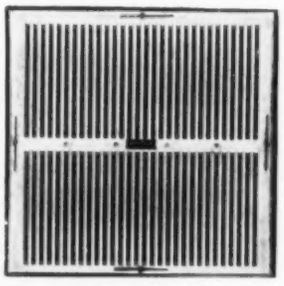

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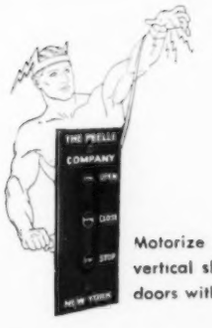

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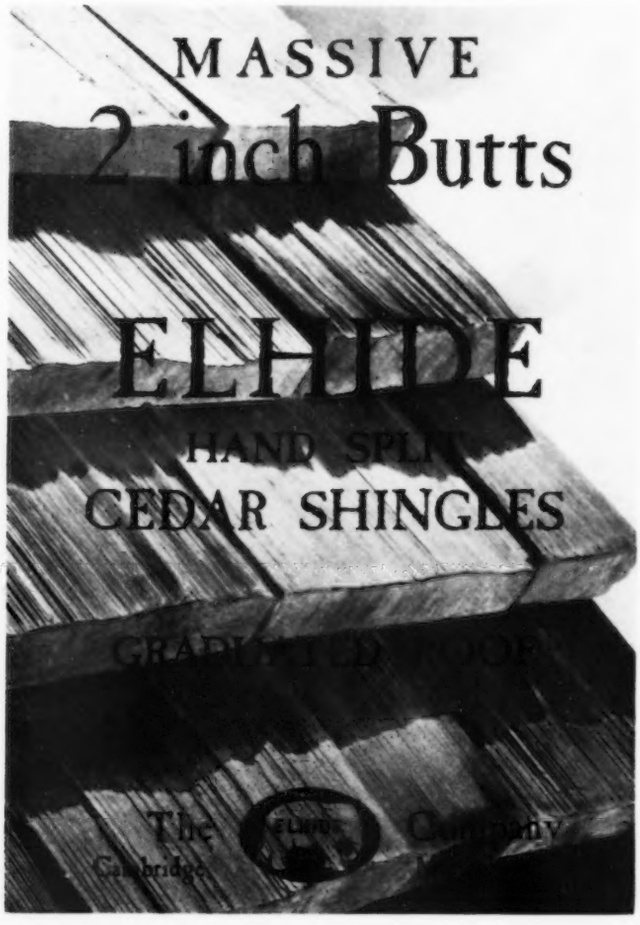

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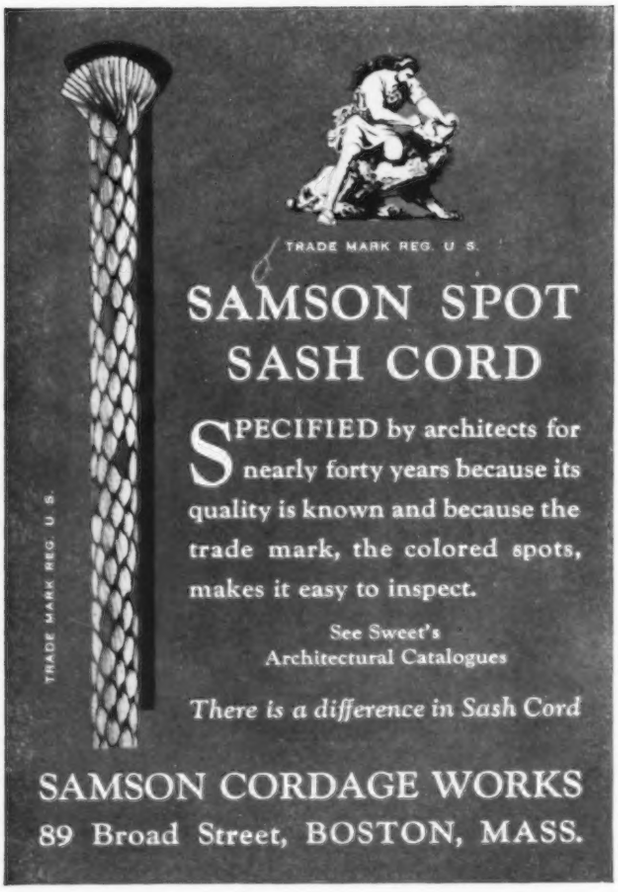

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THERE are sixteen pages in this bulletin, and it is made to conform to A I A files.

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Dahlquist Mfg. Co. ..... 98 ◈
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Garland Mfg. Co. ..... 100 ◈
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National Fireproofing Corp. ..... 20 ◈
National Lead Company ..... 98 ◈
National Tube Company 55
Nelson Herman Corp. ..... 74 ◈

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Peelle Company ..... 99 ◈
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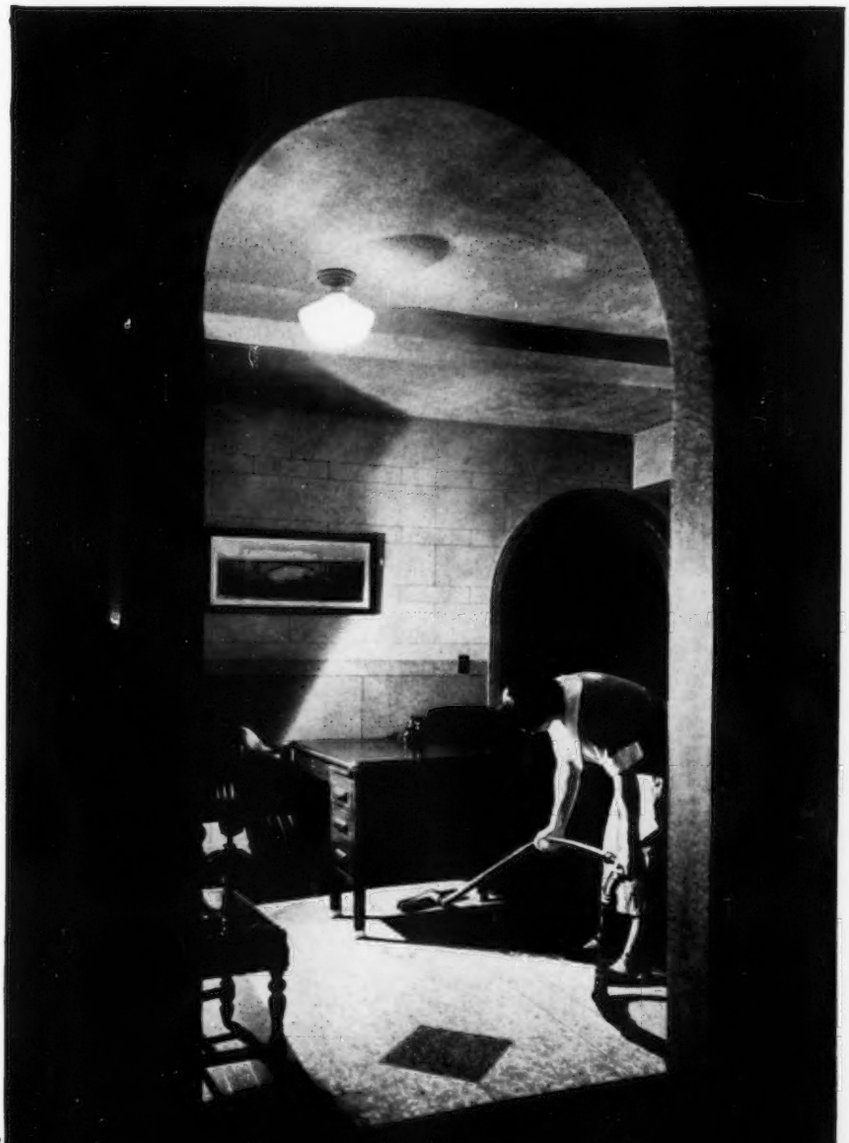


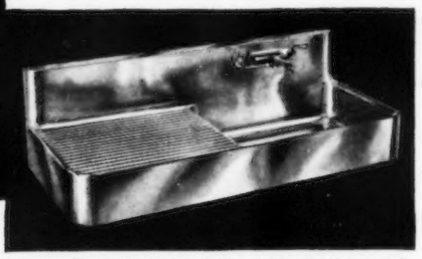
AT ONE A.M.

What happens in your office? What kind of a night "gang" comes in? How much of the dirt and dust goes out? How much does it cost?

The powerful vacuum of the Spencer Central Cleaning System has answered all of these questions satisfactorily in most of the newest, biggest and best buildings in the country. Before you build again, investigate first hand. A list of Spencer installations will be furnished on request.

THE SPENCER TURBINE CO., HARTFORD, CONN.

AT LEFT: *Double drain board Monel Metal kitchen sink.* Made in nominal sizes of 72″ x 21″ and 60″ x 21″.



ABOVE: *Single drain board Monel Metal kitchen sink.* Available in both left- and right-hand drain board models. Made in nominal sizes of 50″ x 21″ and 41″ x 21″.

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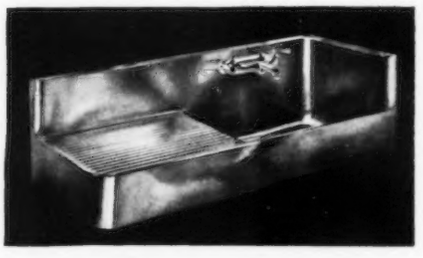
BELOW: *Monel Metal corner kitchen sink.* Splasher at bowl end, drain board either right- or left-hand. Supplied in nominal sizes of 51″ x 21″ and 42″ x 21″.



A kitchen is only as *Modern* as its *Sink*...

EVEN an attractive kitchen loses some of its cheerfulness through the presence of a drab, lifeless-looking sink—or a sink that clashes with the general color scheme. And nothing contributes more to real kitchen charm than a sink of silvery, satin-smooth Monel Metal!

Monel Metal's beauty is soft and restful to the eye—never harsh or glary. Its neutral, platinum-like tone blends pleasantly with every kitchen color, permitting full freedom of color planning. No matter what wall and woodwork tints you or your clients choose, a Monel Metal Sink will always harmonize.

Modern, yet thoroughly practical in design and construction, Monel Metal Sinks embody advantages of convenience and utility never before available in *any* standardized sink. Yet these new-day sinks are priced well within reach of the average purse. They are sold by leading plumbing supply houses. See them—and write for specification details and descriptive literature.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 WALL STREET, NEW YORK, N. Y.

Monel Metal Sinks offer these 8 points of Superiority:

1. Rich, lustrous beauty with a satiny, glass-smooth surface.
2. Rust-proof . . . highly resistant to corrosion . . . easy to clean and keep clean.
3. Solid metal clear through, with no coating to chip, crack or wear off. Steel-like strength gives lifetime durability.
4. Neutral, silver tone that blends with any kitchen color scheme. Gives new freedom to kitchen decoration.
5. 10 standardized models and 6 standardized sizes. A model and size for any type of kitchen.
6. 31% more working space than an ordinary sink of same nominal size.
7. One-piece construction of heavy gauge Monel Metal. No joints or seams. Reinforced and sound-deadened.
8. Standardized construction and quantity production bring prices within reach of the average purse.

A HIGH NICKEL ALLOY
MONEL METAL
NICKEL ALLOYS LOOK BETTER LONGER

Monel Metal is a registered trade mark applied to a technically controlled nickel-copper alloy of high nickel content. Monel Metal is mined, smelted, refined, rolled and marketed solely by International Nickel.

Specify THORP DOORS

THE approach to a building focuses attention and interest on the entrance. In the Spokane and Eastern Trust Company Building, Thorp once again has faithfully expressed in metal the designs envisioned by the architect. The entrances are a part of the building—adding to its quality and richness. The entrance doors here are of nickel silver, satin finish, 12 gauge, with extruded mouldings; nickel silver grilles in doors; nickel silver transom sash. Frames and cast grilles were under separate contract working in conjunction with Thorp. "By Thorp" also were three other sets of entrance doors and sash—and all elevator enclosure work.

●

SPOKANE AND EASTERN TRUST COMPANY BUILDING
Spokane, Washington
A. MOORMAN AND CO., *Architects*

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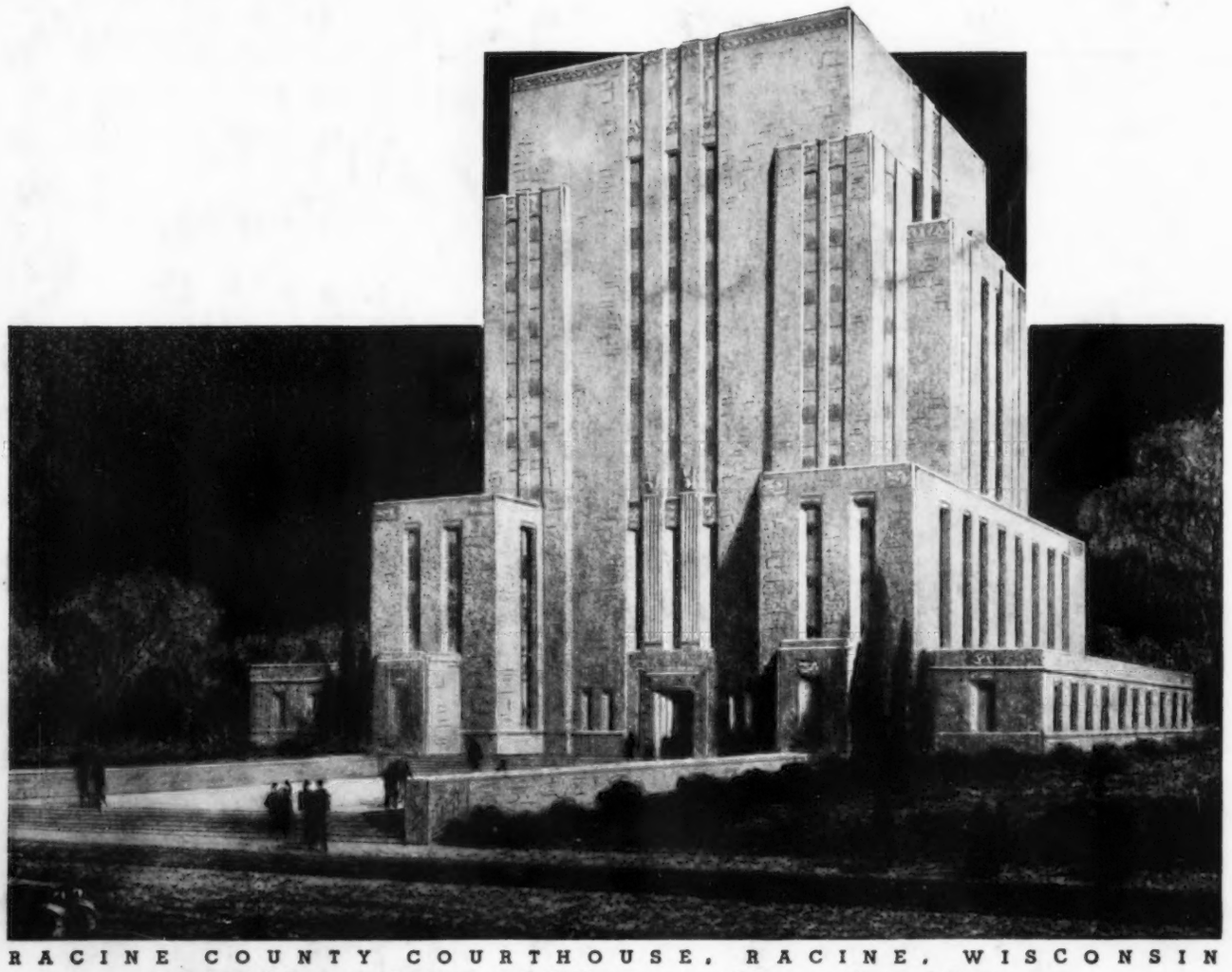
THORP FIRE PROOF DOOR CO., ***Minneapolis, Minn.***

Westinghouse Elevators are the logical highways of modern architecture



RACINE COUNTY COURTHOUSE, RACINE, WISCONSIN
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an architectural gem throughout

Racine manifests pride in the new courthouse—carefully planned to command the admiration of future generations. Where exacting and modern refinements and definite perfection of engineering details are demanded, Westinghouse Elevators are chosen.

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